



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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September 24, 1969

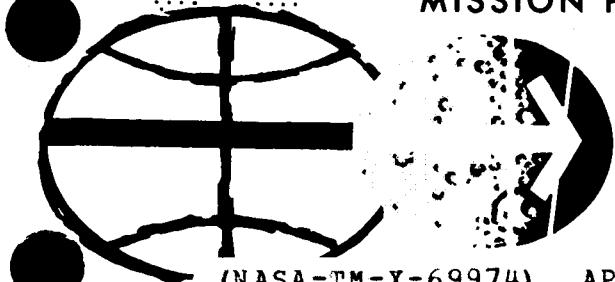
APOLLO LUNAR TRACKING  
COVERAGE FOR 1970

(This internal note supersedes MSC IN 69-FM-238  
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Lunar Mission Analysis Branch

MISSION PLANNING AND ANALYSIS DIVISION

MANNED SPACECRAFT CENTER  
HOUSTON, TEXAS



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PROJECT APOLLO

APOLLO LUNAR TRACKING COVERAGE FOR 1970

By Edward M. Jiongo  
Lunar Mission Analysis Branch

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September 24, 1969

MISSION PLANNING AND ANALYSIS DIVISION  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
MANNED SPACECRAFT CENTER  
HOUSTON, TEXAS

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## APOLLO LUNAR TRACKING COVERAGE FOR 1970

By Edward M. Jiongo

During a lunar mission, certain stations will be required to provide tracking coverage at selected times; for example, Goldstone will provide tracking coverage at powered descent initiation. Presented in this document are figures that show the Greenwich mean time of the periods when the moon is visible to four tracking sites: Parks, Australia; Madrid, Spain; Goldstone, California; and Canberra, Australia. The data presented in the figures of this revised document completely supersede the data presented in the original document (MSC IN 69-FM-238).

Data for launch days from January to December 1970 are presented in figures 1 through 12. For each month, 16 days of tracking coverage are shown which correspond to the periods when a lunar mission would be flown if one was scheduled for that month. Thus, the days for which coverage is shown are not exactly the same from month to month.

Acquisition and termination of the moon for these stations is  $6^{\circ}$  minimum elevation with respect to each tracking site except for Parks which is  $30^{\circ}$ . Because of this higher minimum elevation angle for Parks, the tracking period is much shorter than for the other three stations.

Also note from the figures that the tracking period for a given station varies in length from month to month. This variation is caused by the change in lunar declination. A tracking station located at a southern latitude will have a shorter period of coverage when the moon has a northern declination than when both are in the same hemisphere.

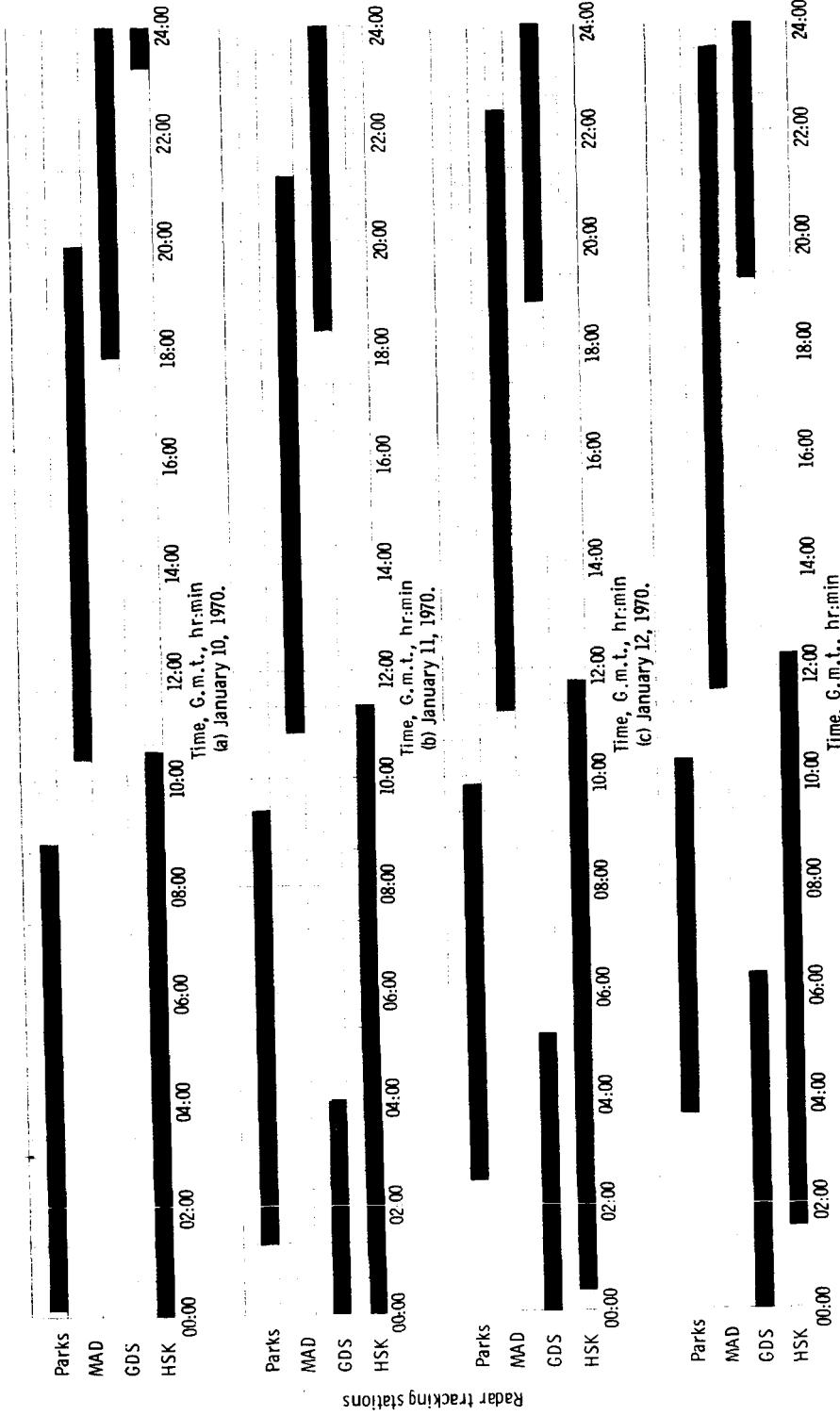


Figure 1. - Lunar tracking coverage for Apollo launch days in January.

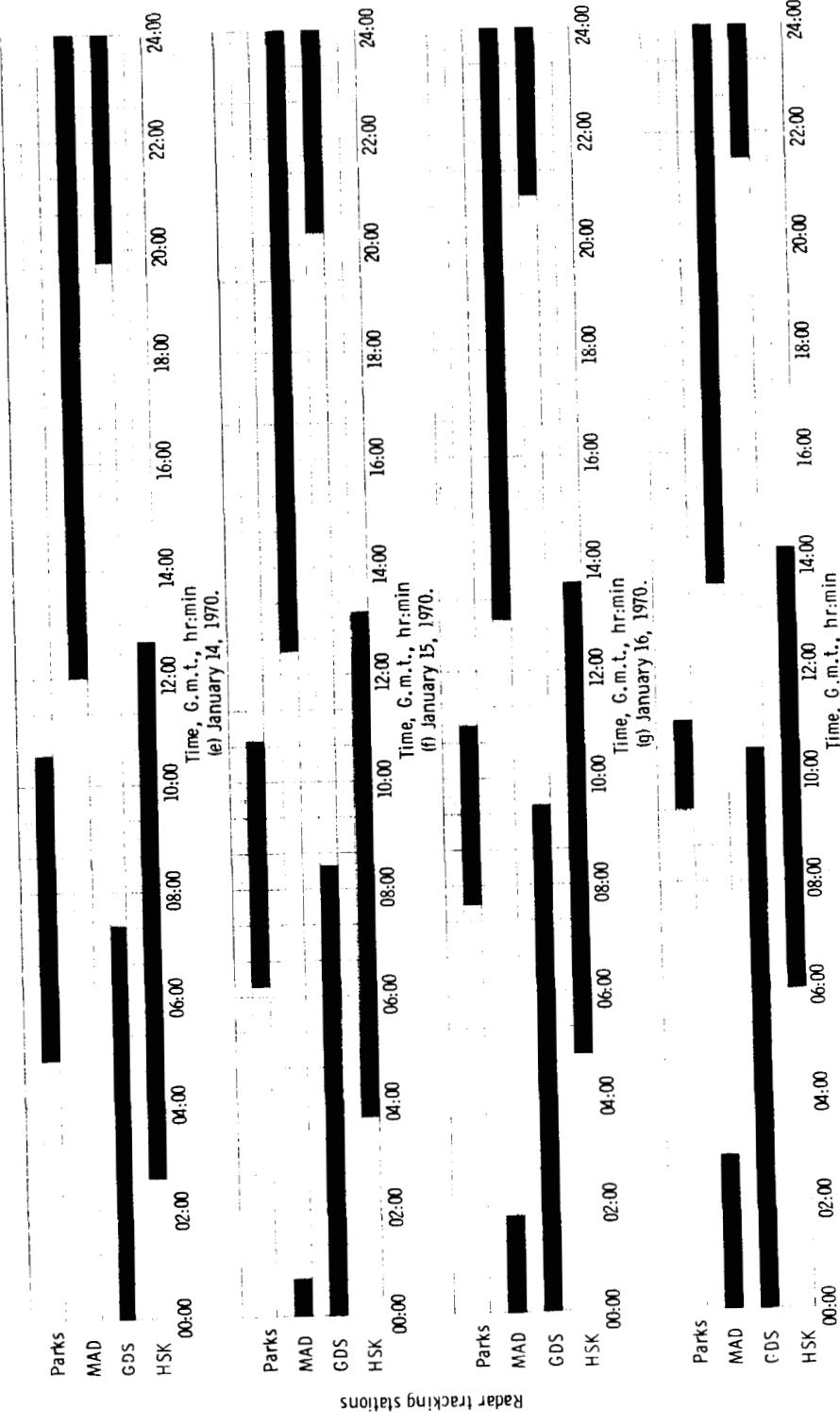
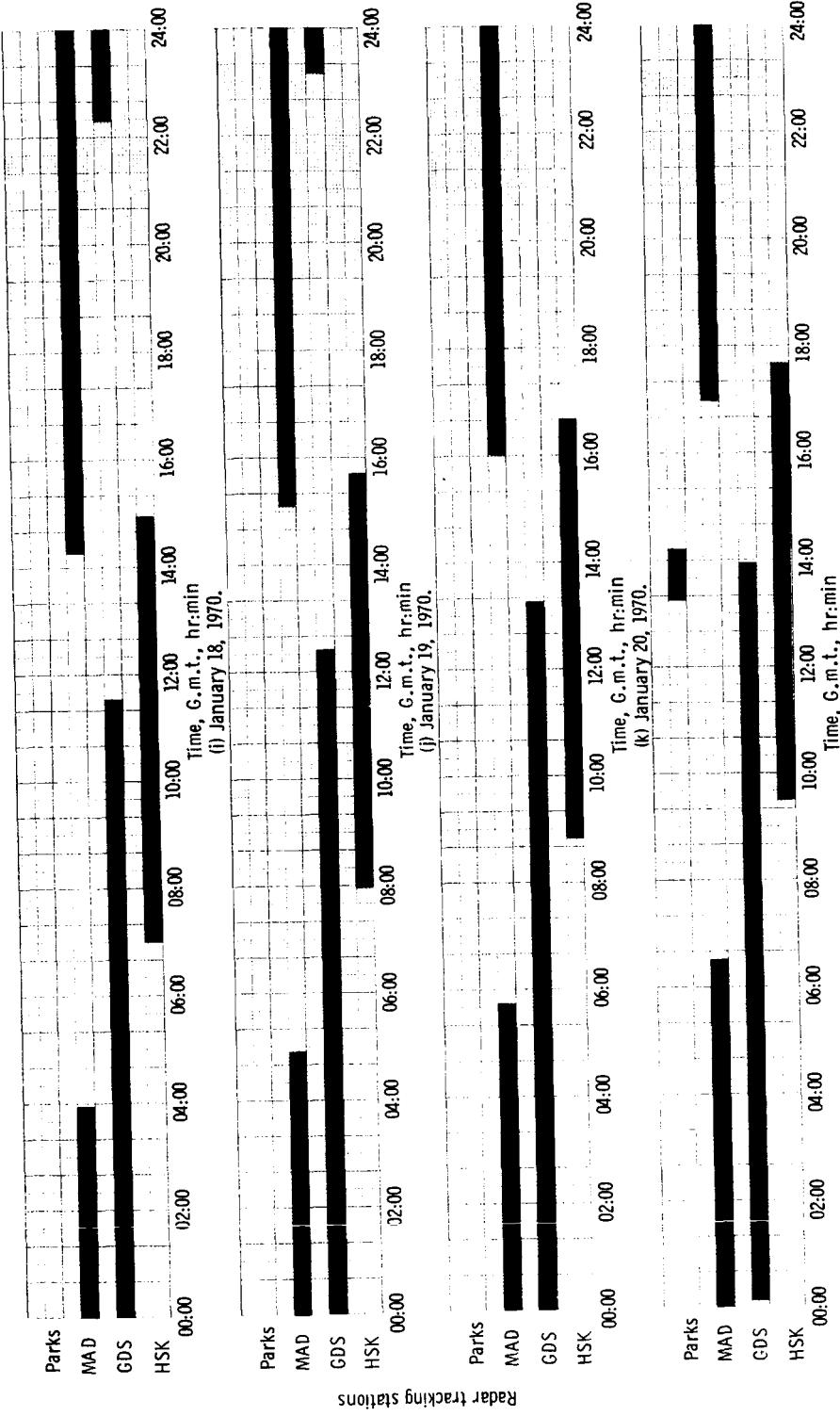


Figure 1.- Continued.



(i) January 18, 1970.  
(ii) January 19, 1970.  
Figure 1 - Continued.

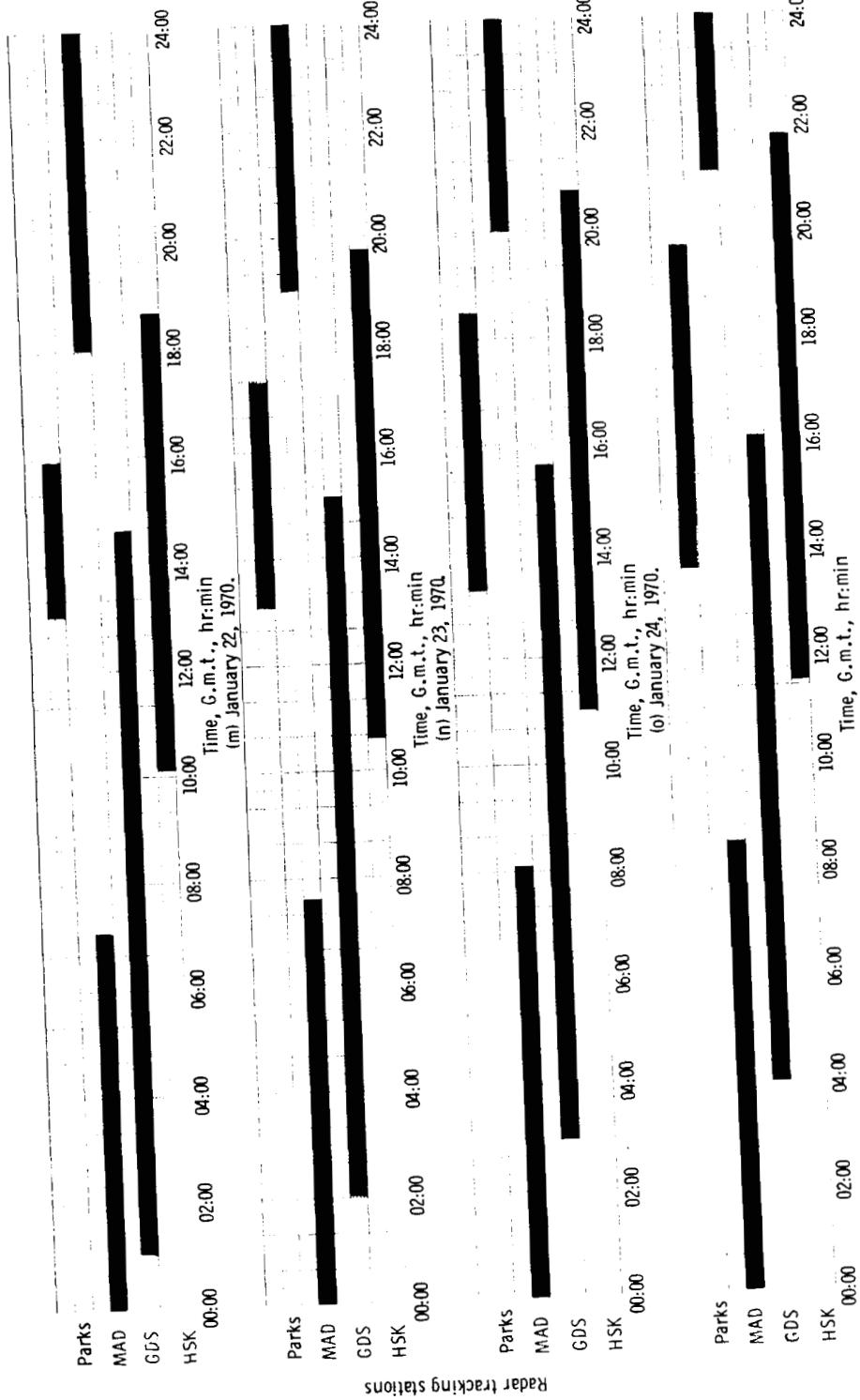


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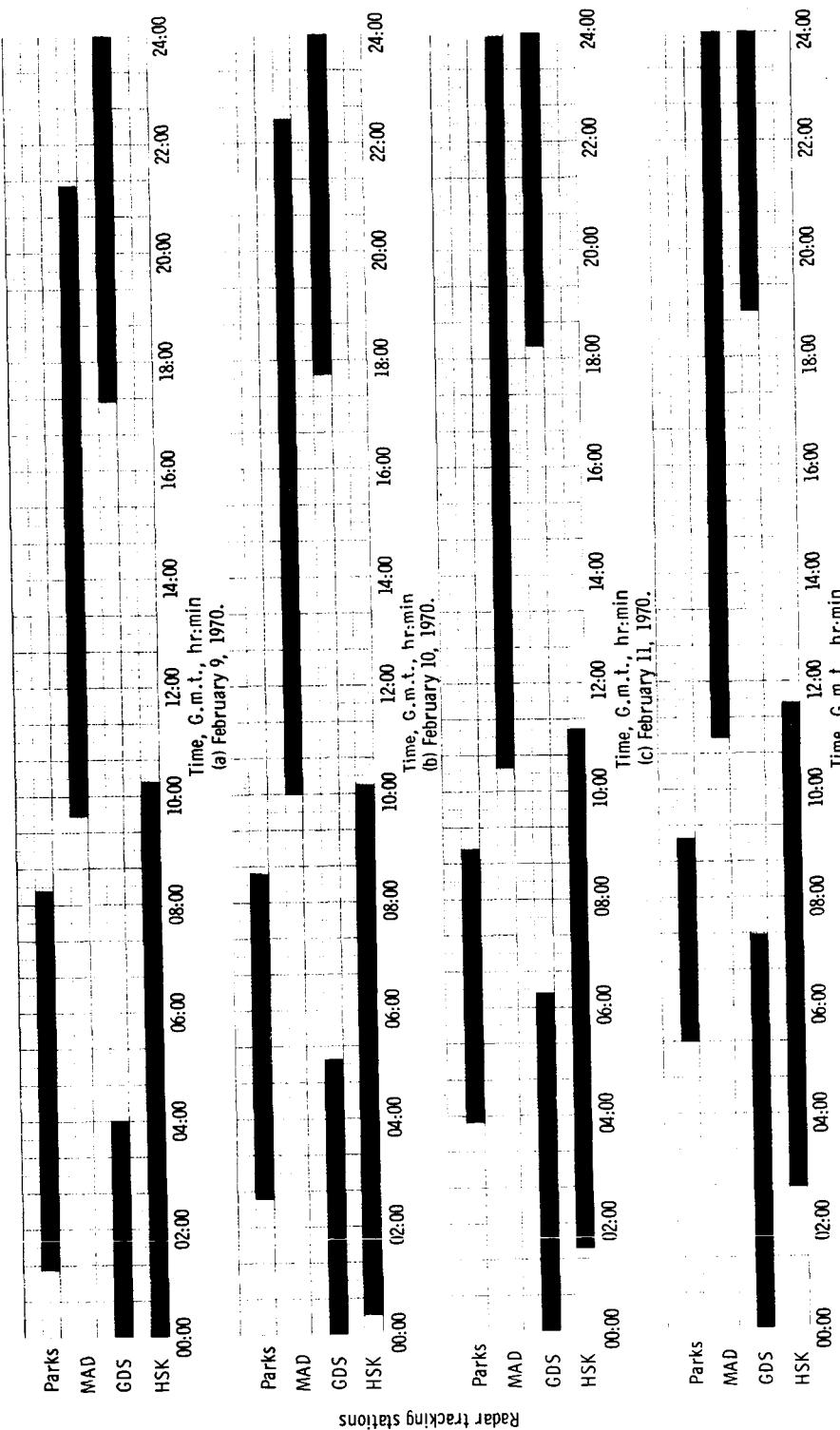


Figure 2.- Lunar tracking coverage for Apollo launch days in February.

(d) February 12, 1970.

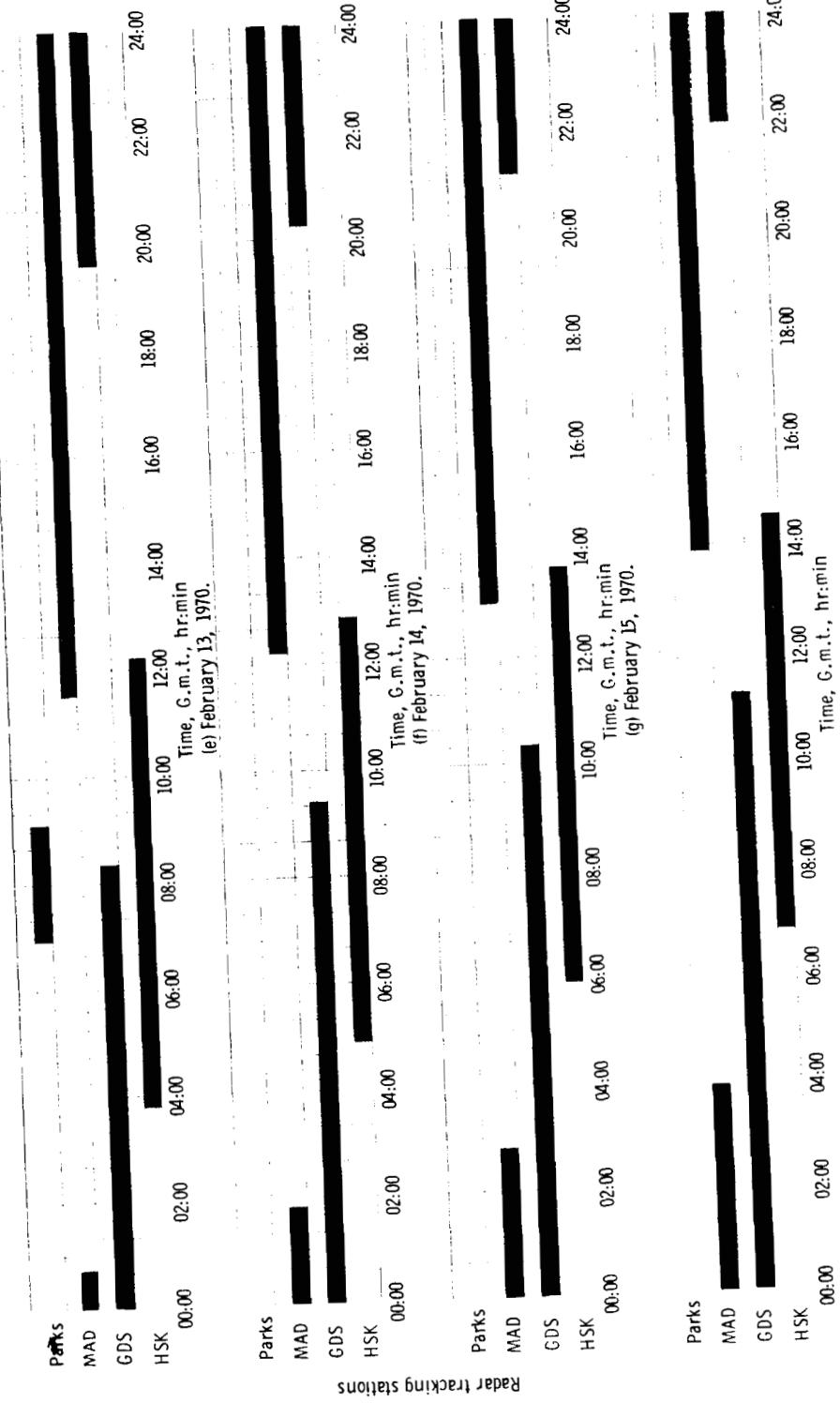


Figure 2. - Continued.

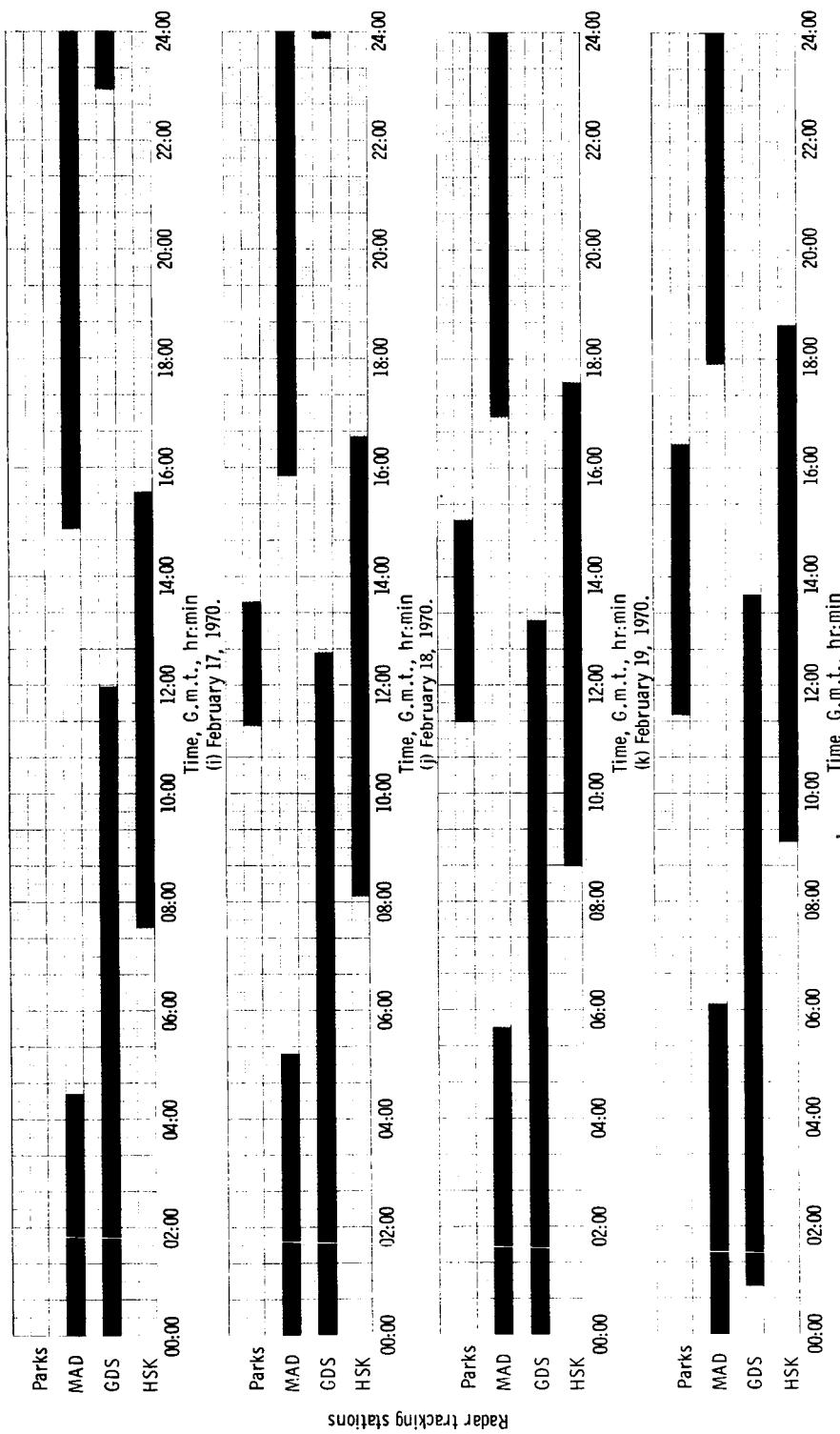
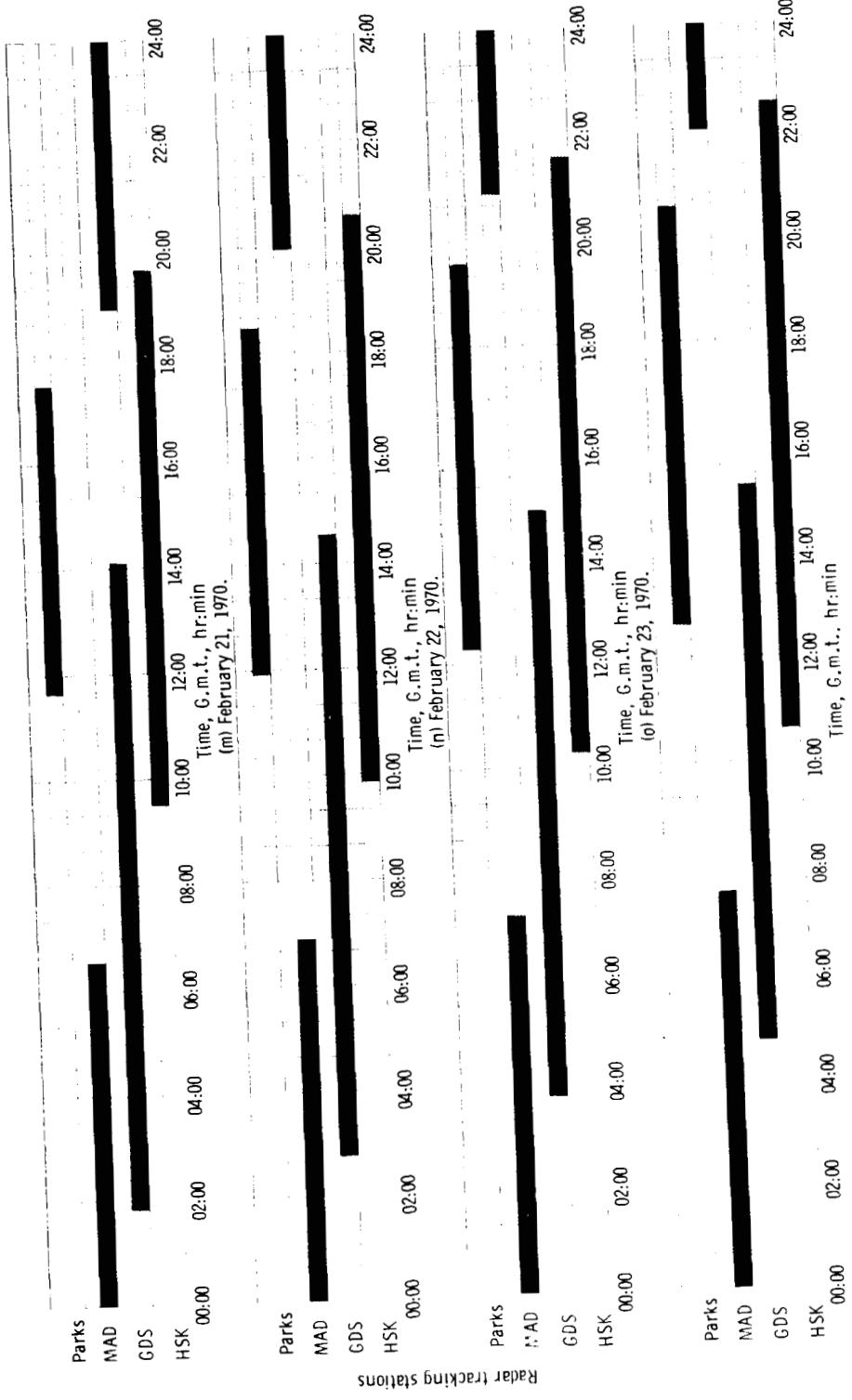


Figure 2.- Continued.



(p) February 24, 1970.

Figure 2 - Concluded.

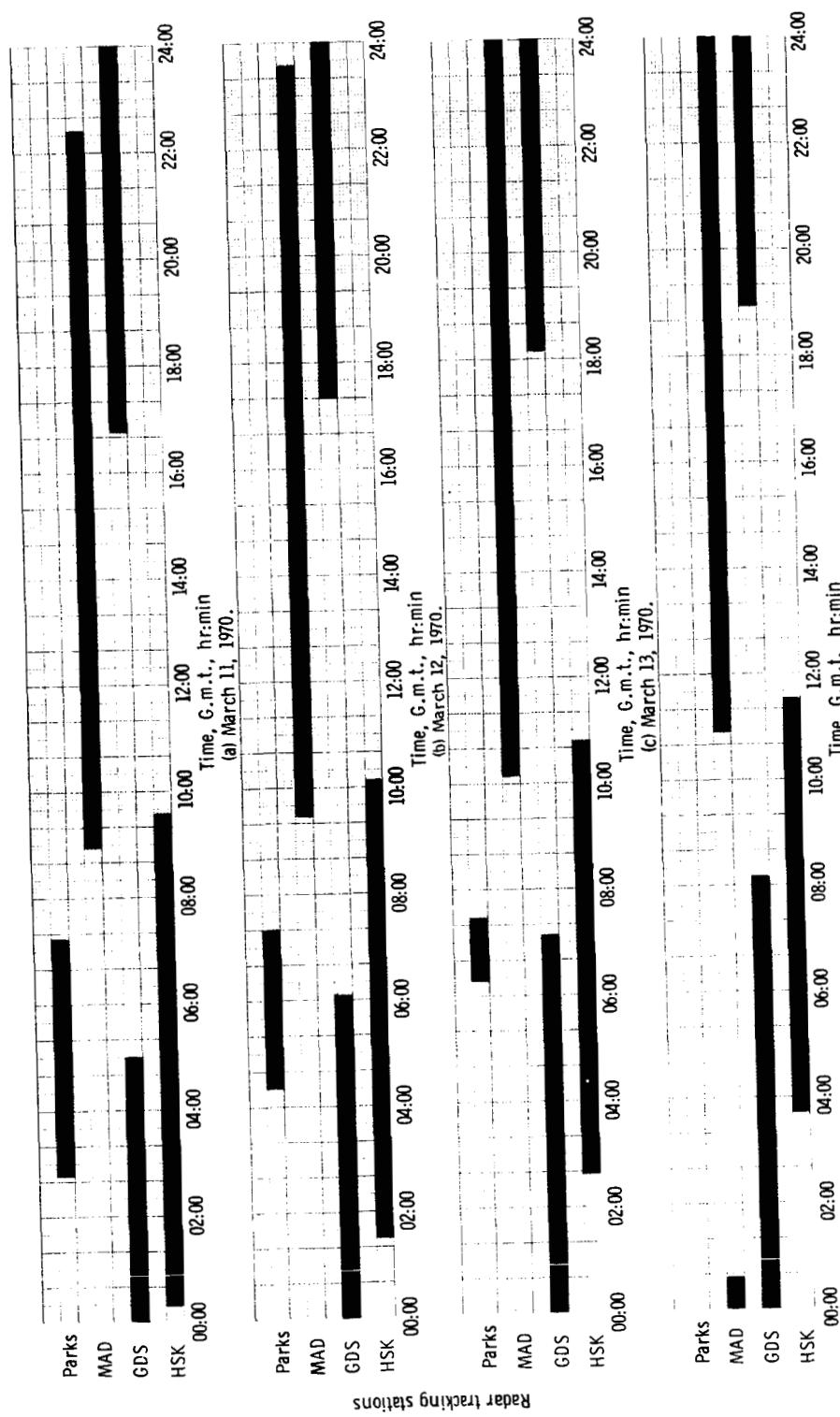
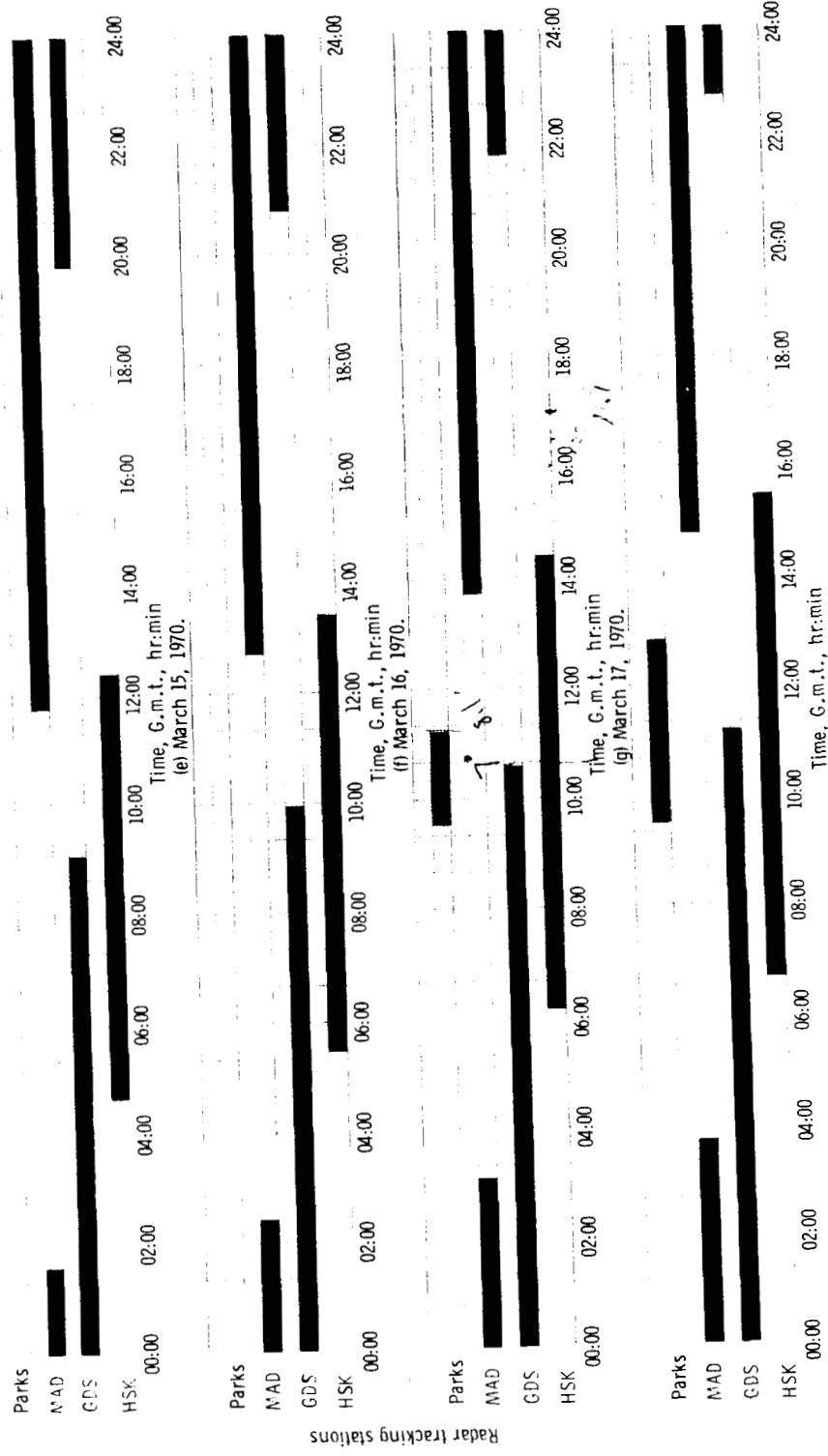
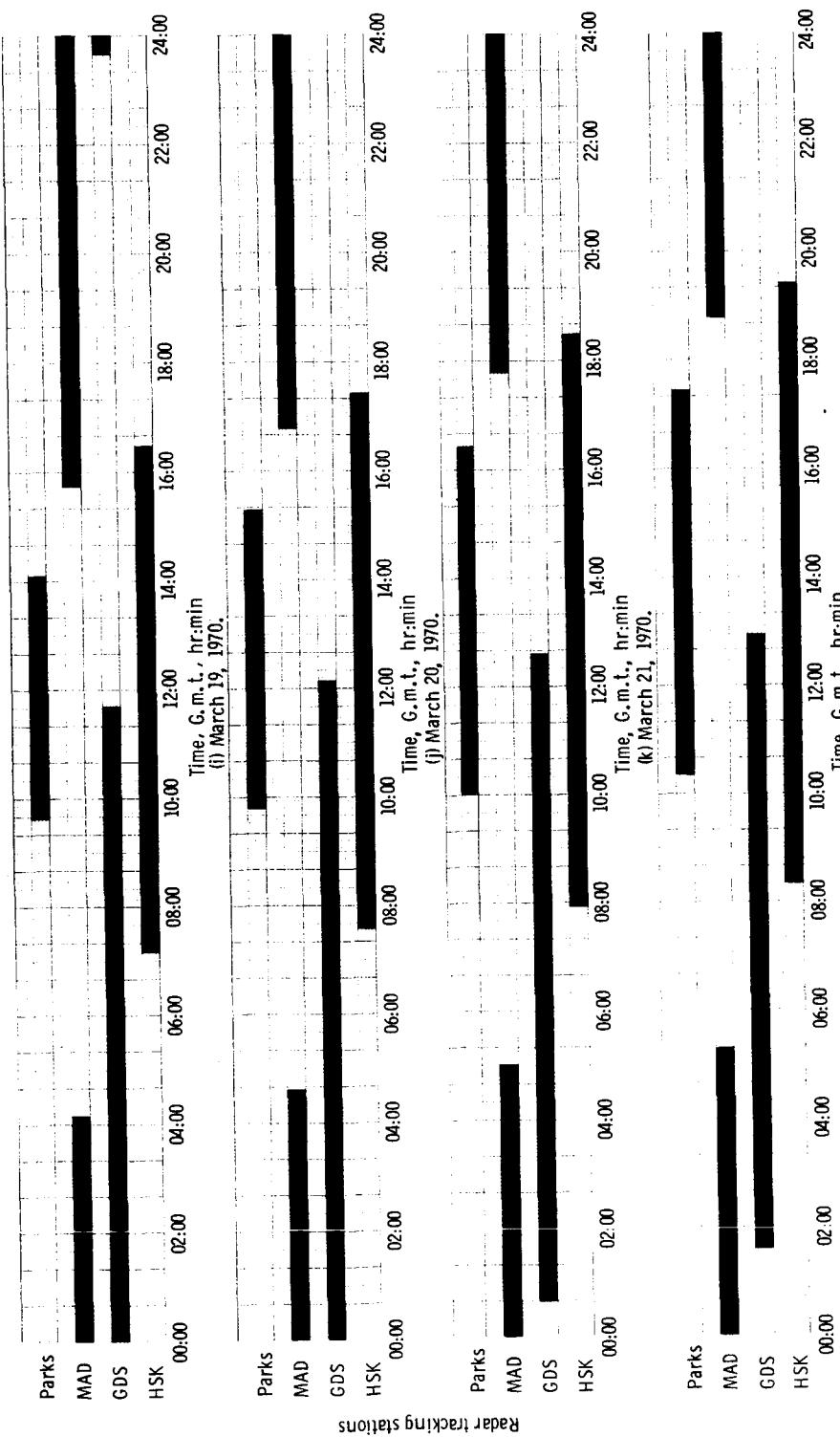


Figure 3 - Lunar tracking coverage for Apollo launch days in March.



(h) March 18, 1970.

Figure 3 - Continued.



(l) March 22, 1970.

Figure 3. - Continued.

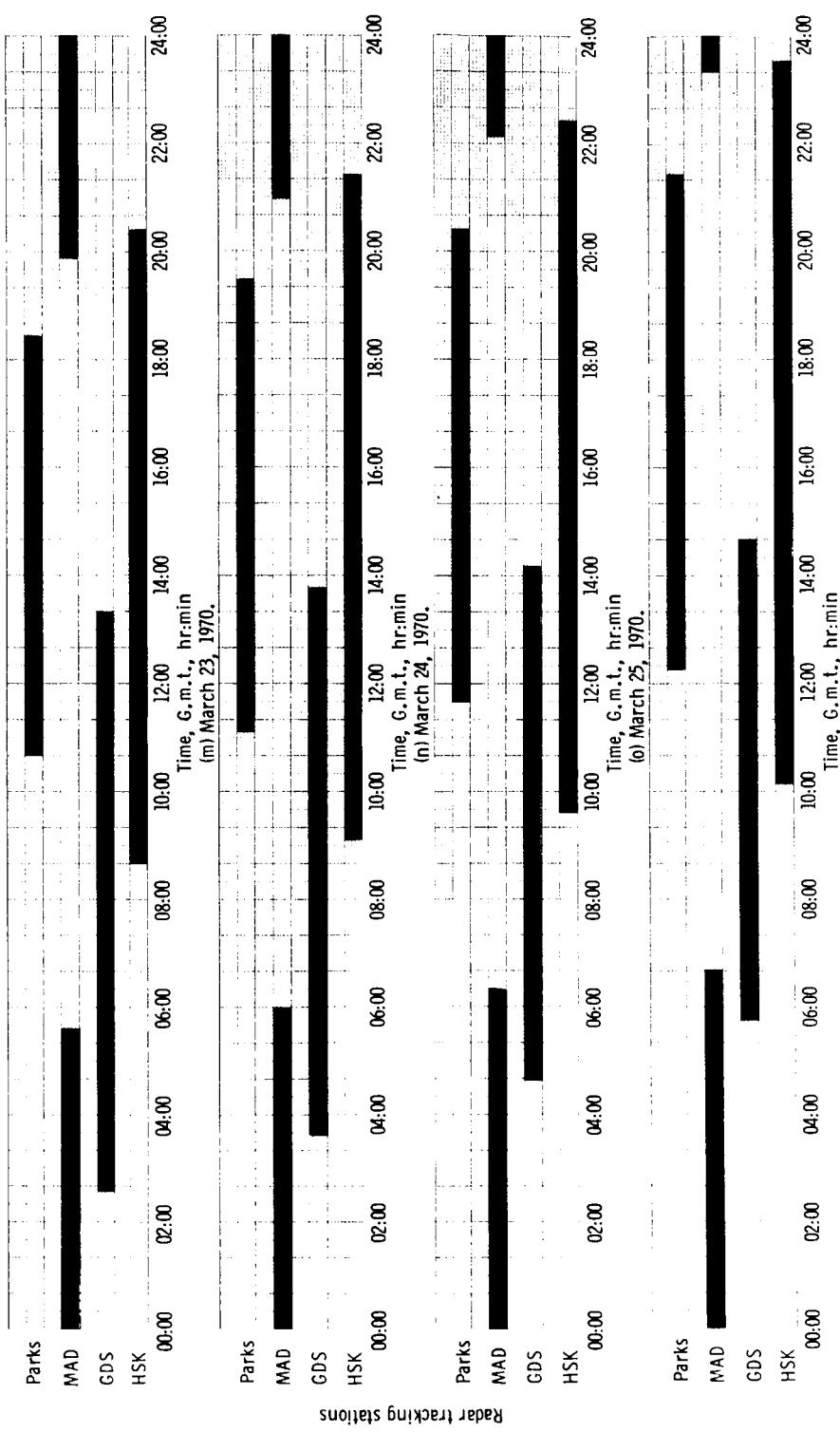


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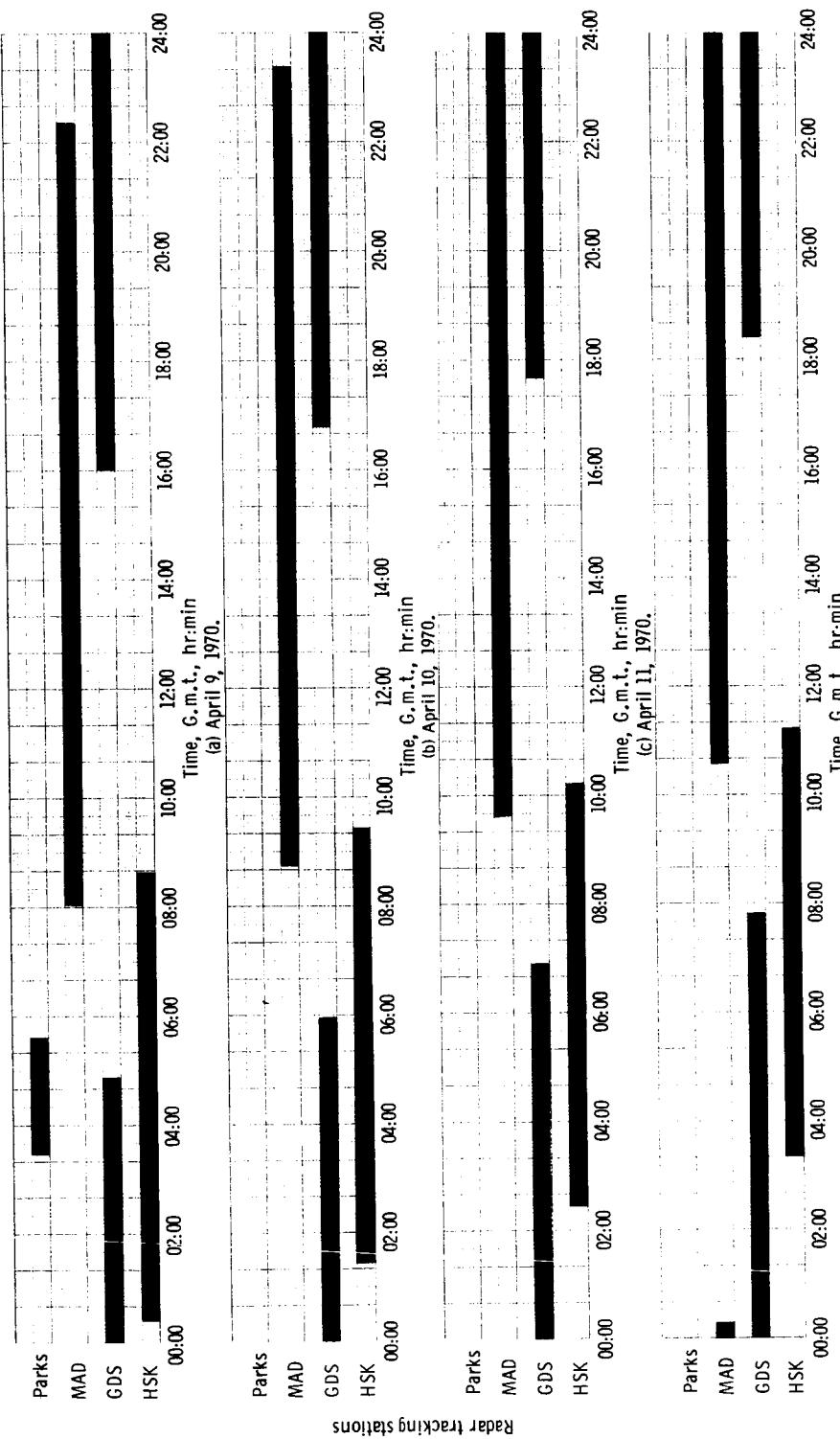


Figure 4.- Lunar tracking coverage for Apollo launch days in April.

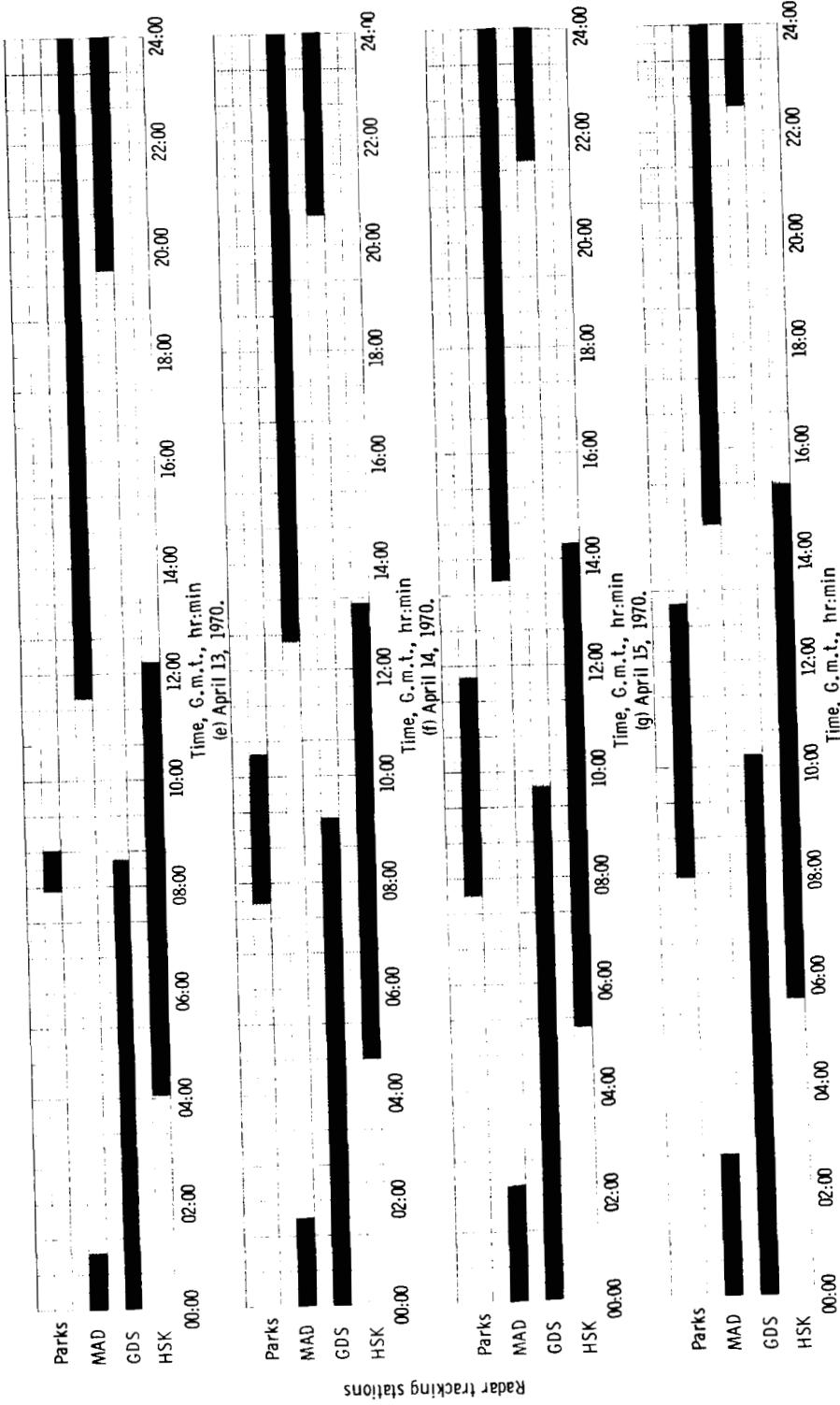
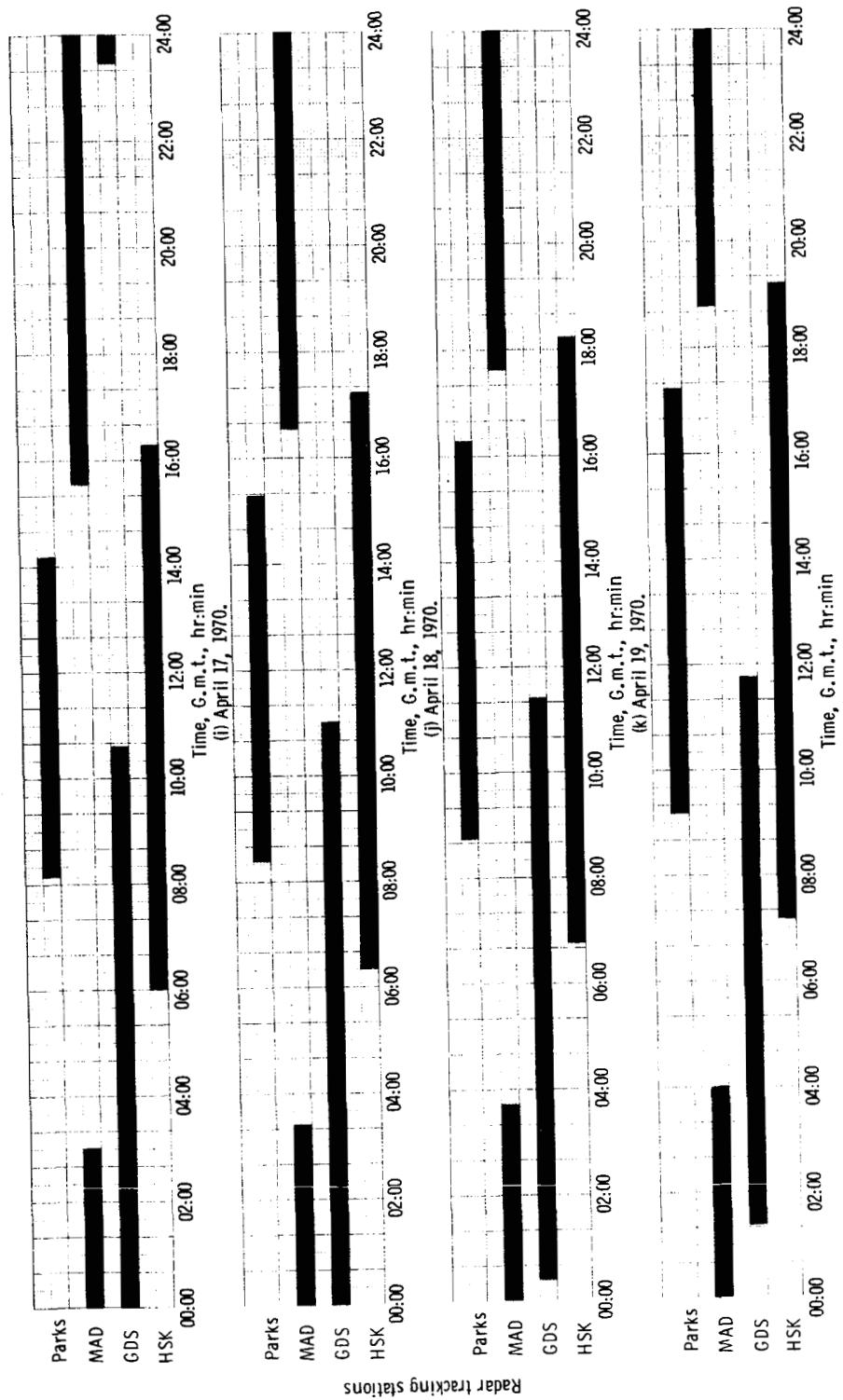
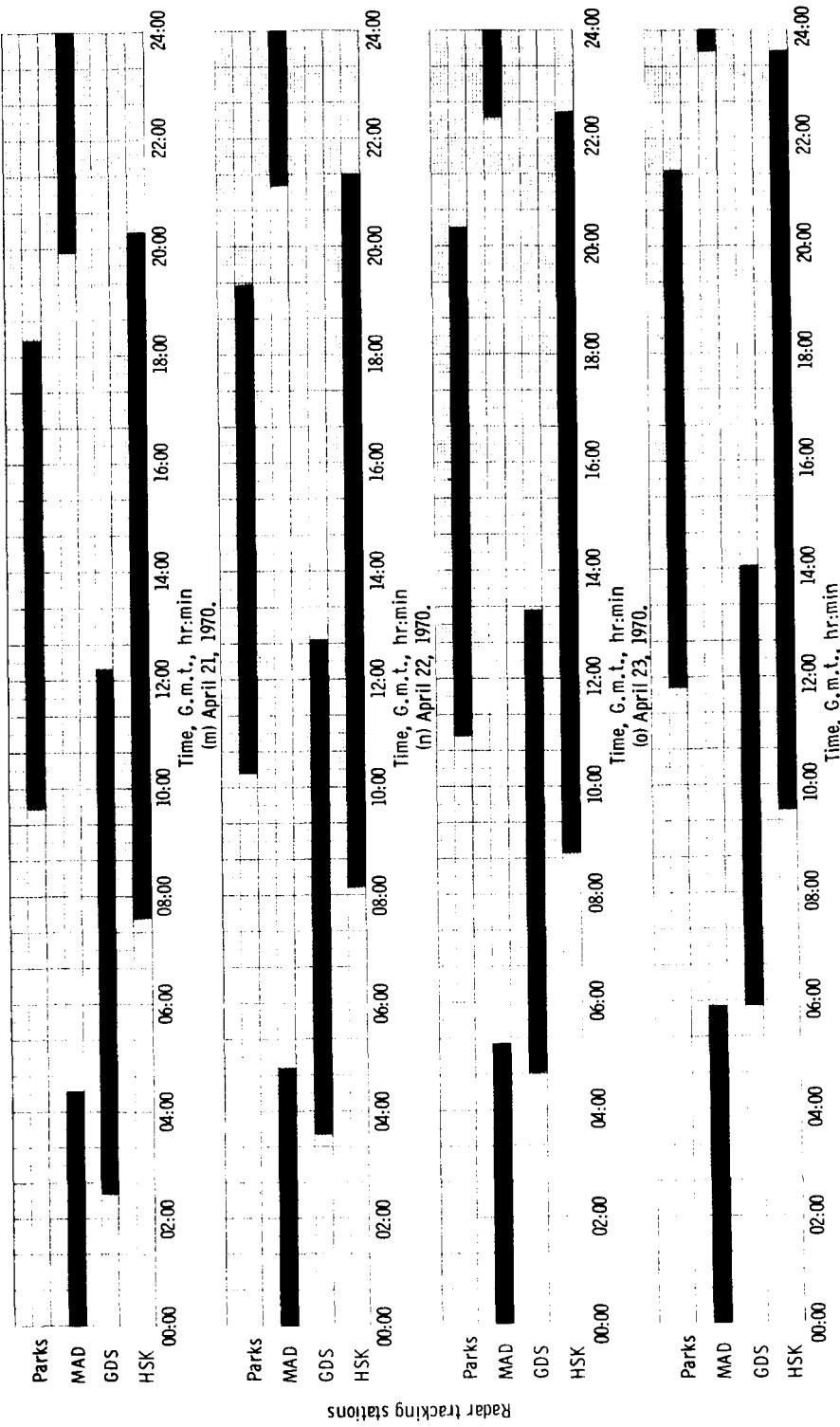


Figure 4.- Continued.



(l) April 20, 1970.

Figure 4.-Continued.



(p) April 24, 1970.

Figure 4 - Concluded.

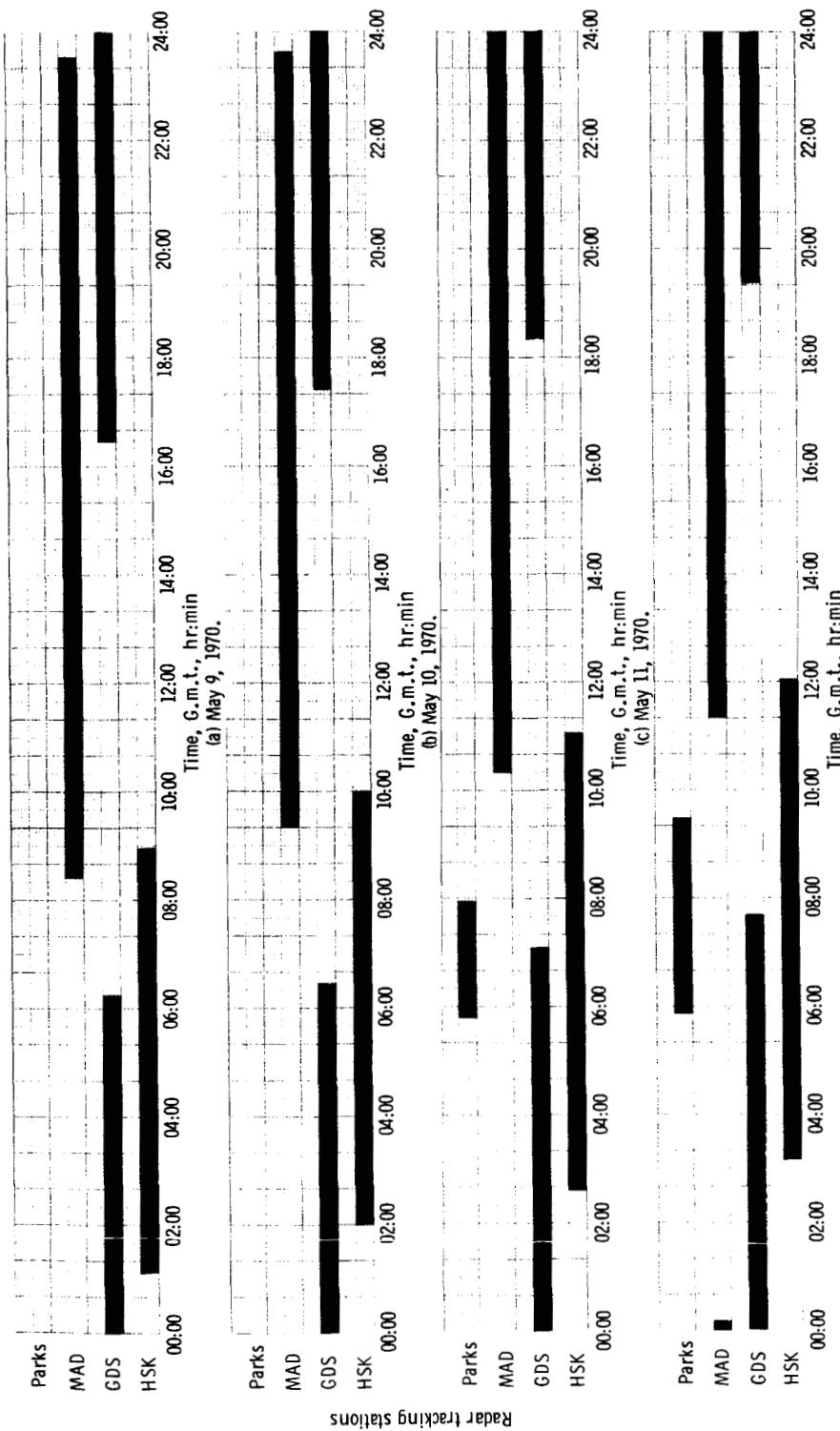
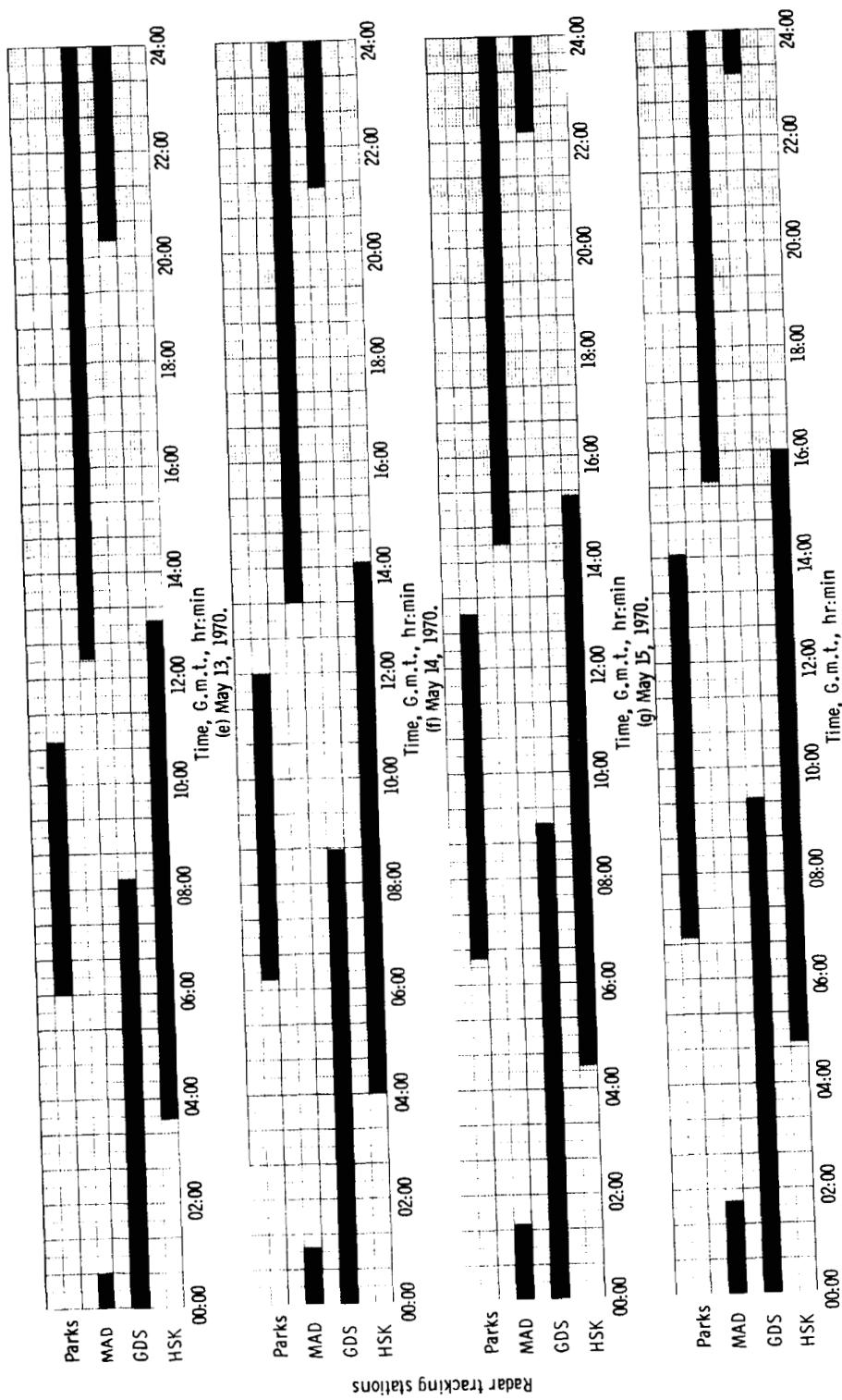


Figure 5. - Lunar tracking coverage for Apollo launch days in May.



(h) May 16, 1970.  
Figure 5.- Continued.

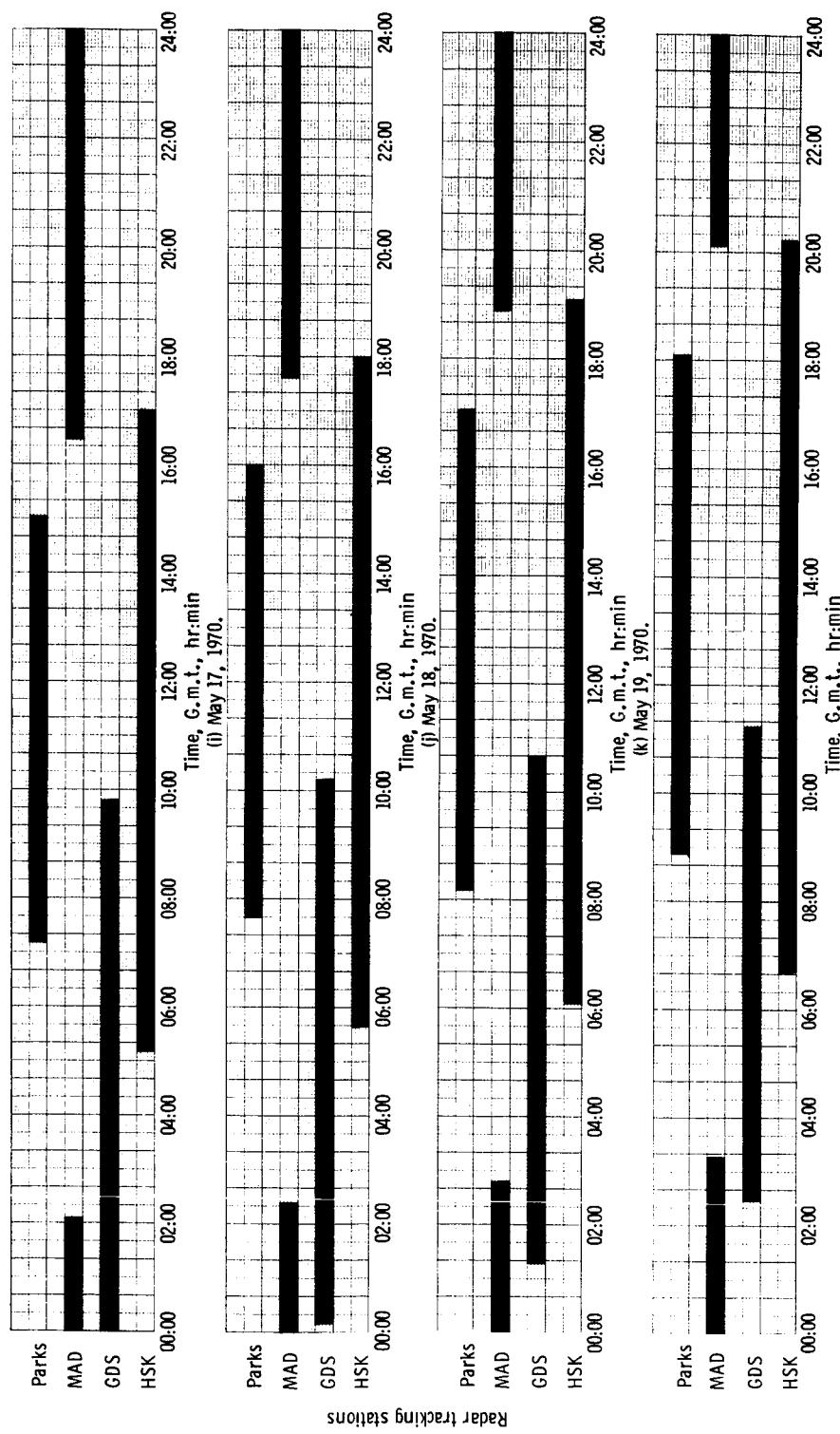


Figure 5. - Continued.

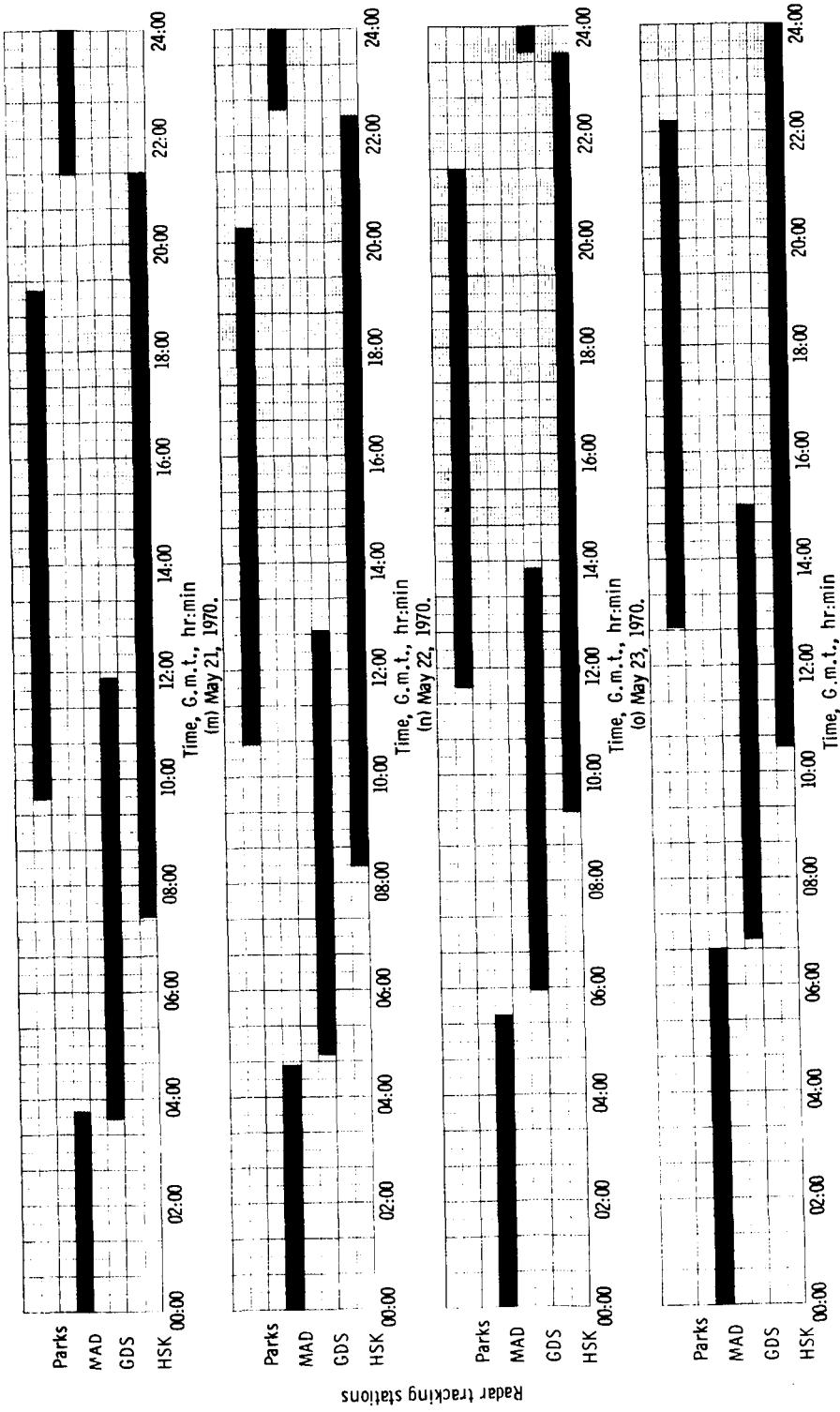


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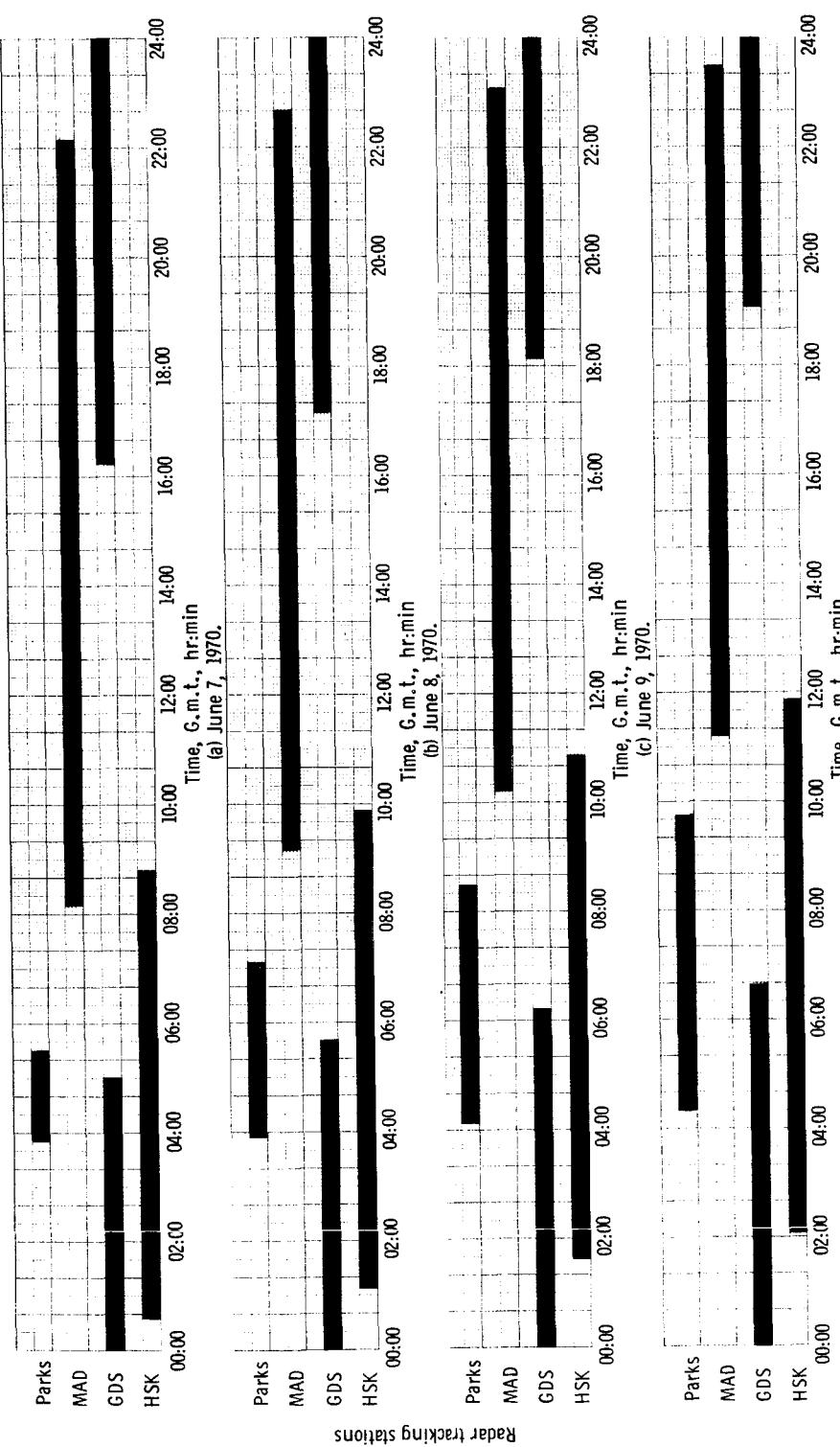
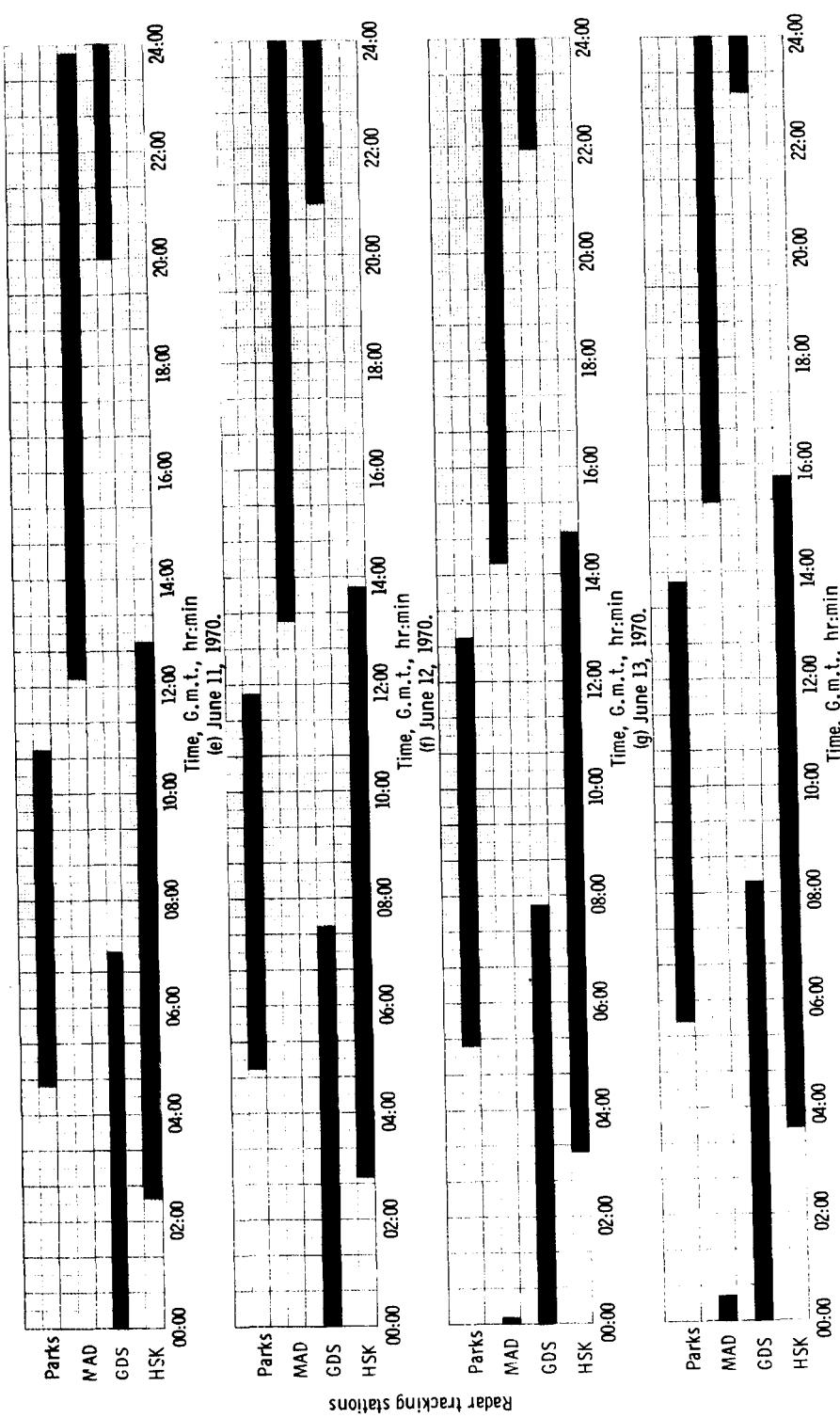


Figure 6. - Lunar tracking coverage for Apollo launch days in June.

(d) June 10, 1970.



(h) June 14, 1970.

Figure 6.- Continued.

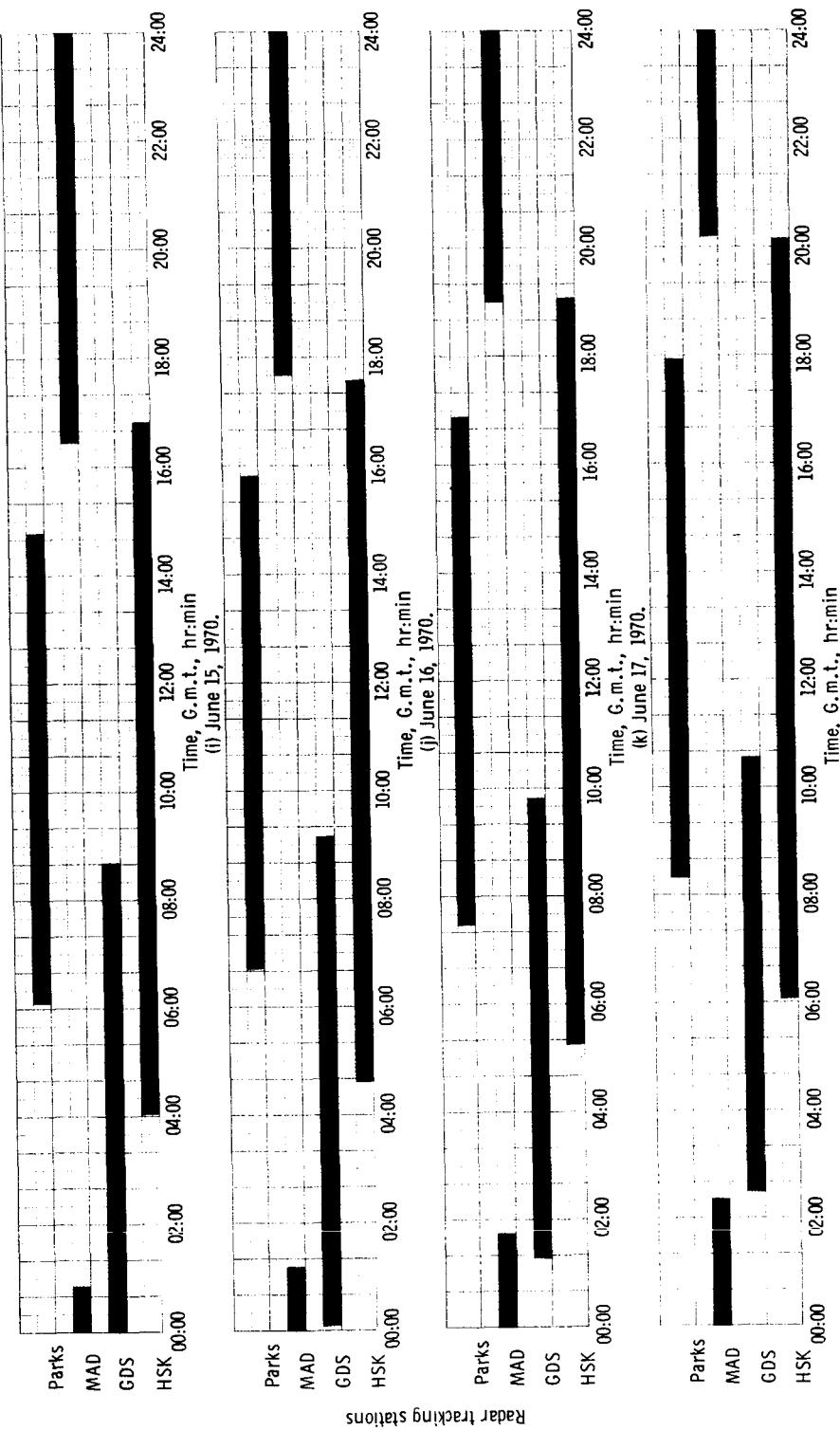


Figure 6.- Continued.

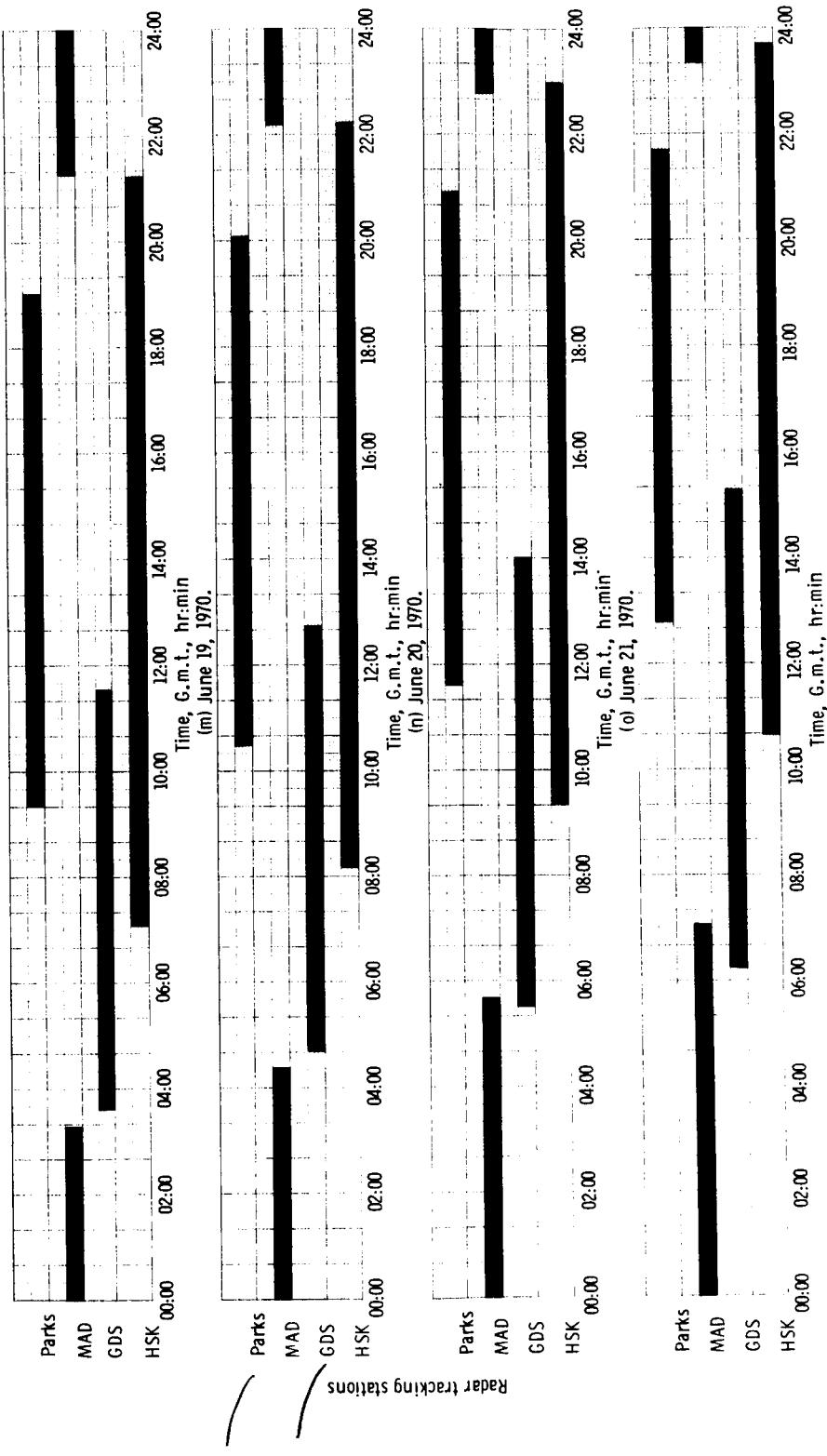


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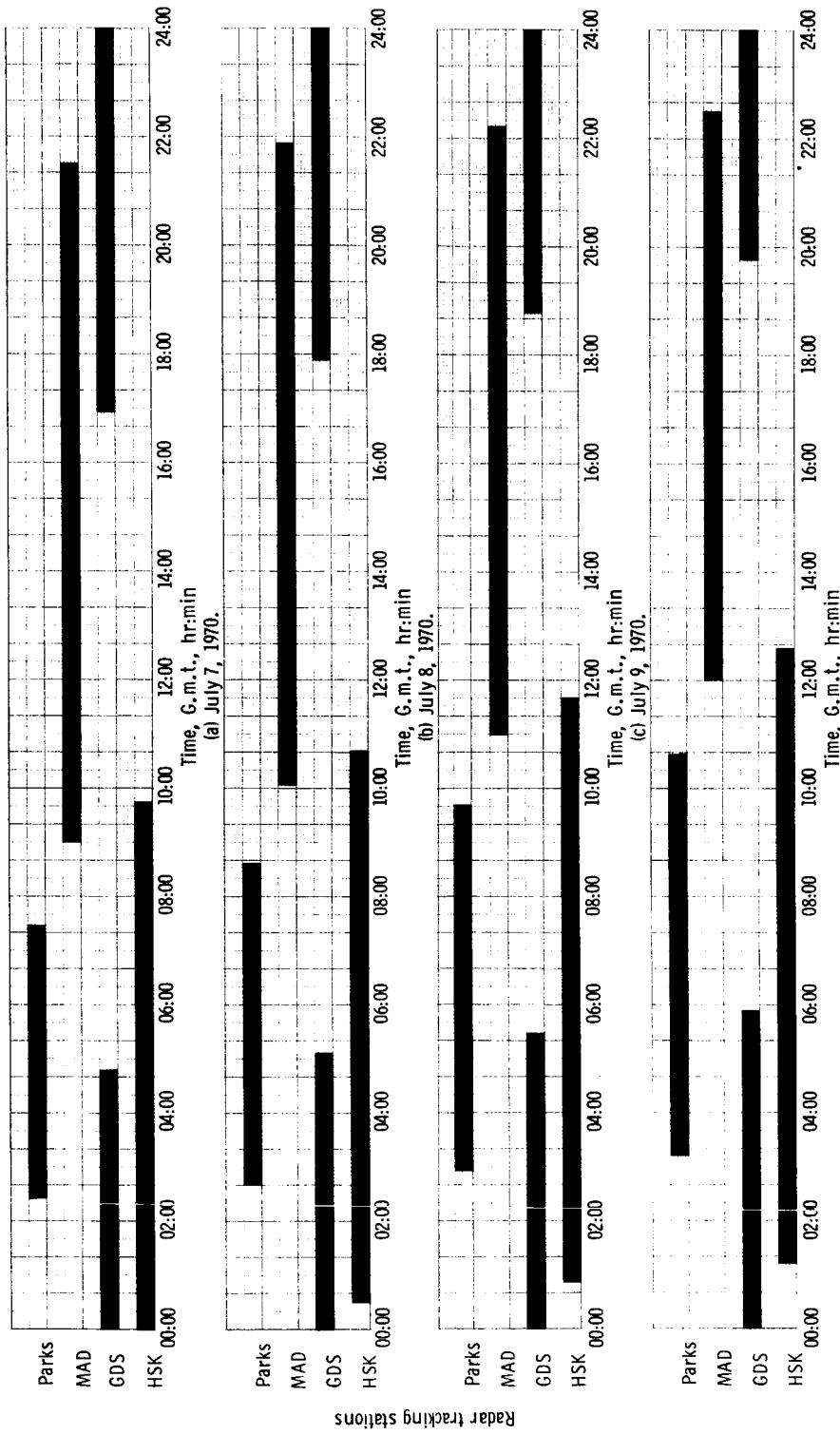


Figure 7. - Lunar tracking coverage for Apollo launch days in July.

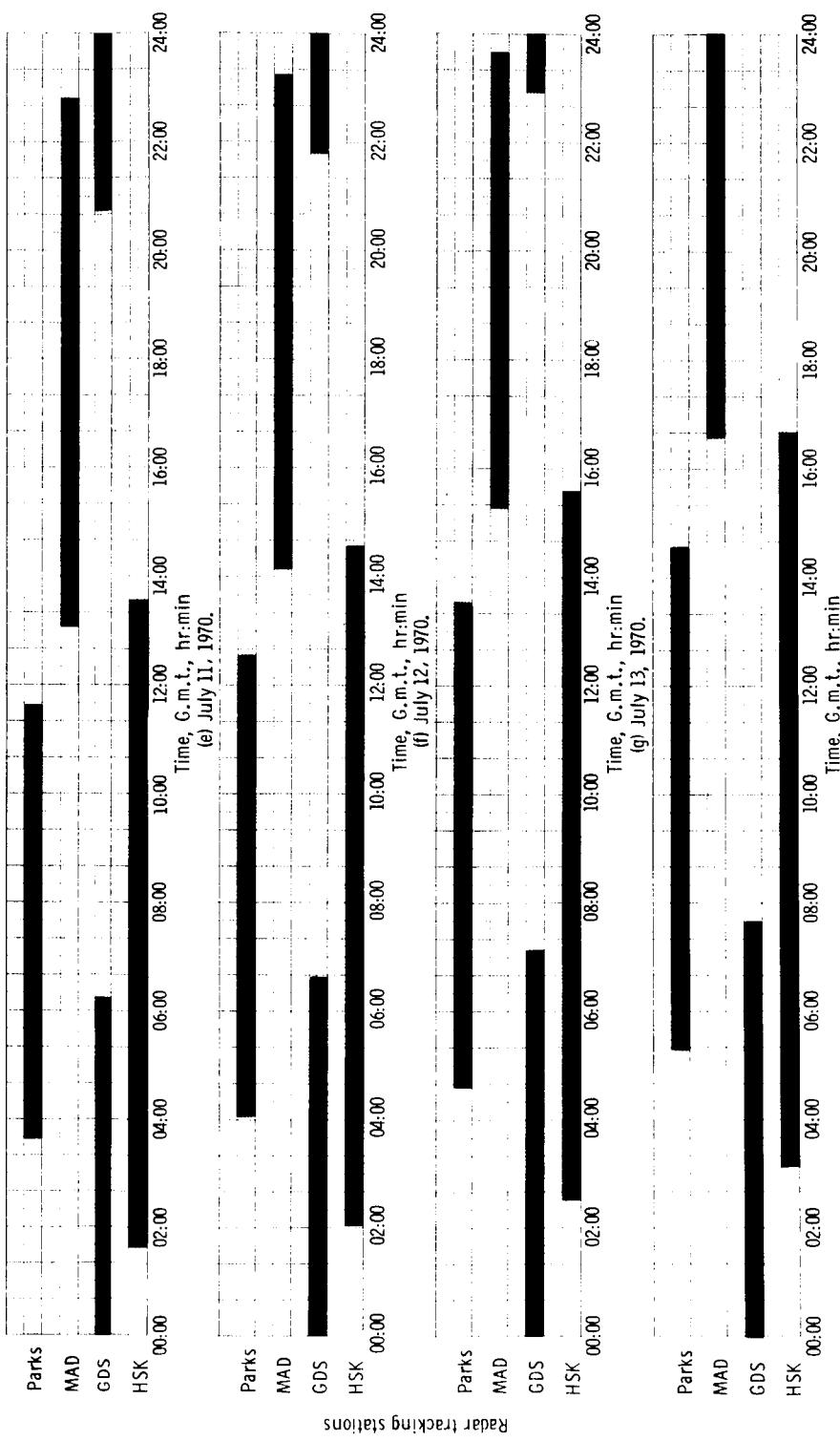
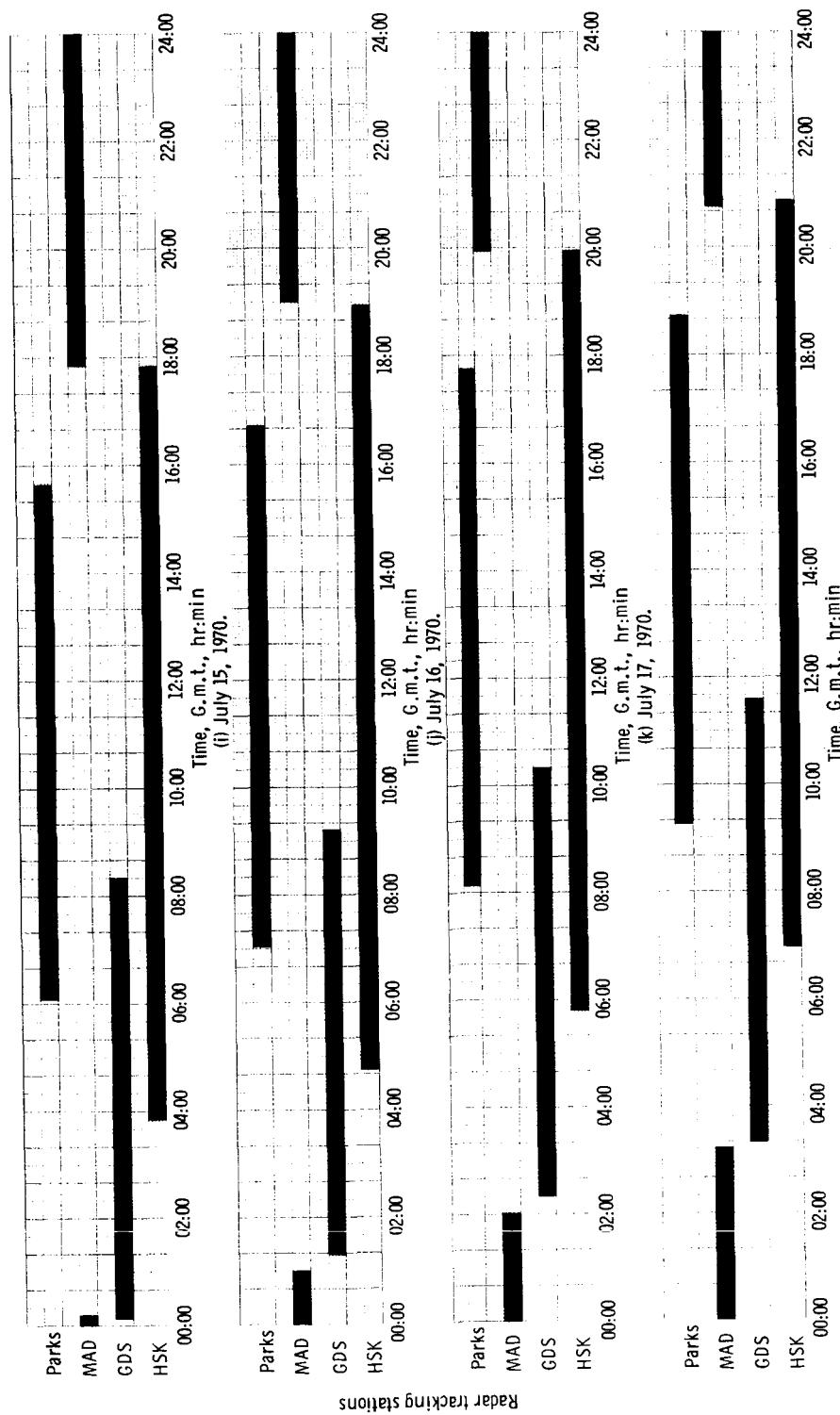


Figure 7. - Continued.



(L) July 18, 1970.

Figure 7.- Continued.

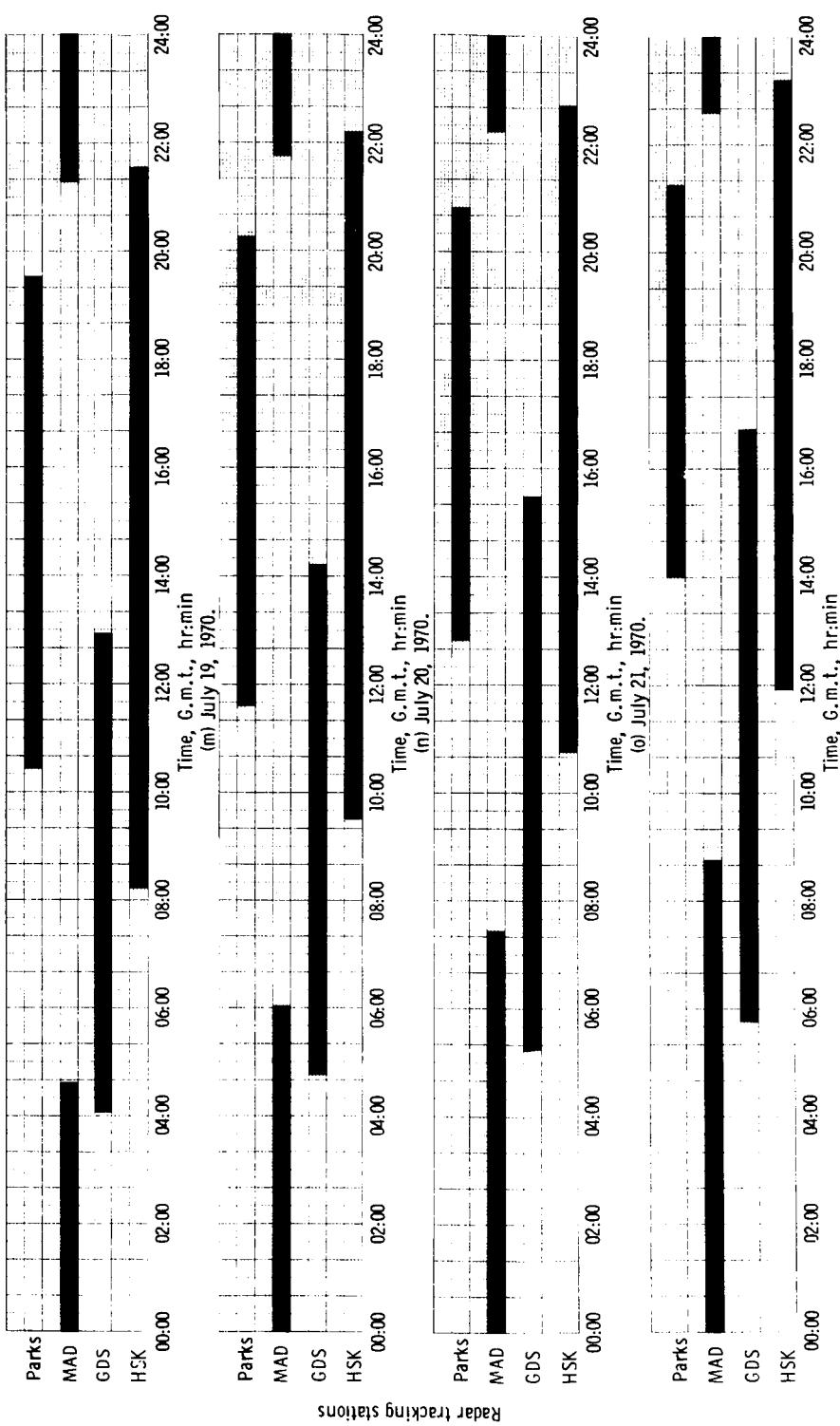


Figure 7. - Concluded.

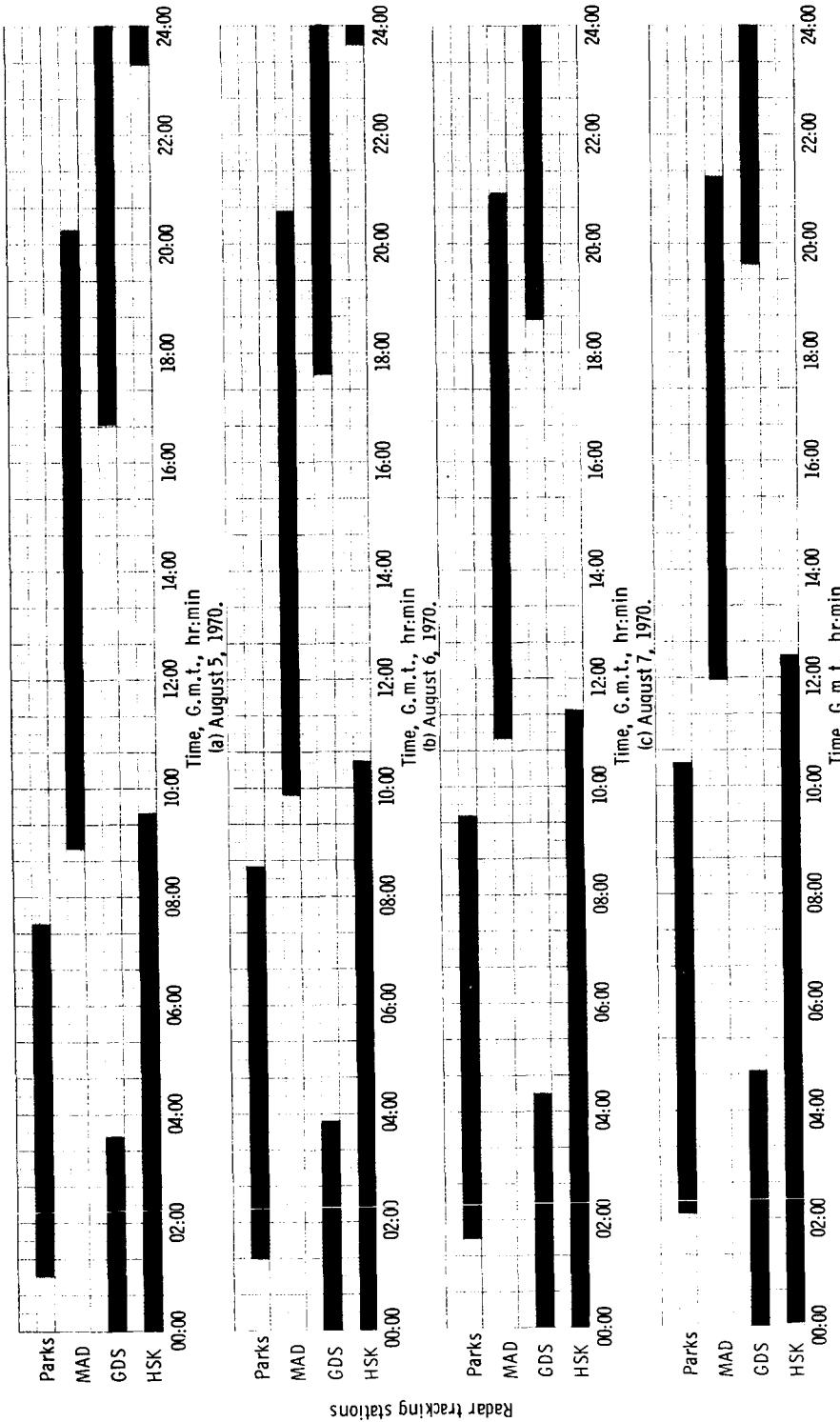


Figure 8. - Lunar tracking coverage for Apollo launch days in August.

(d) August 8, 1970.

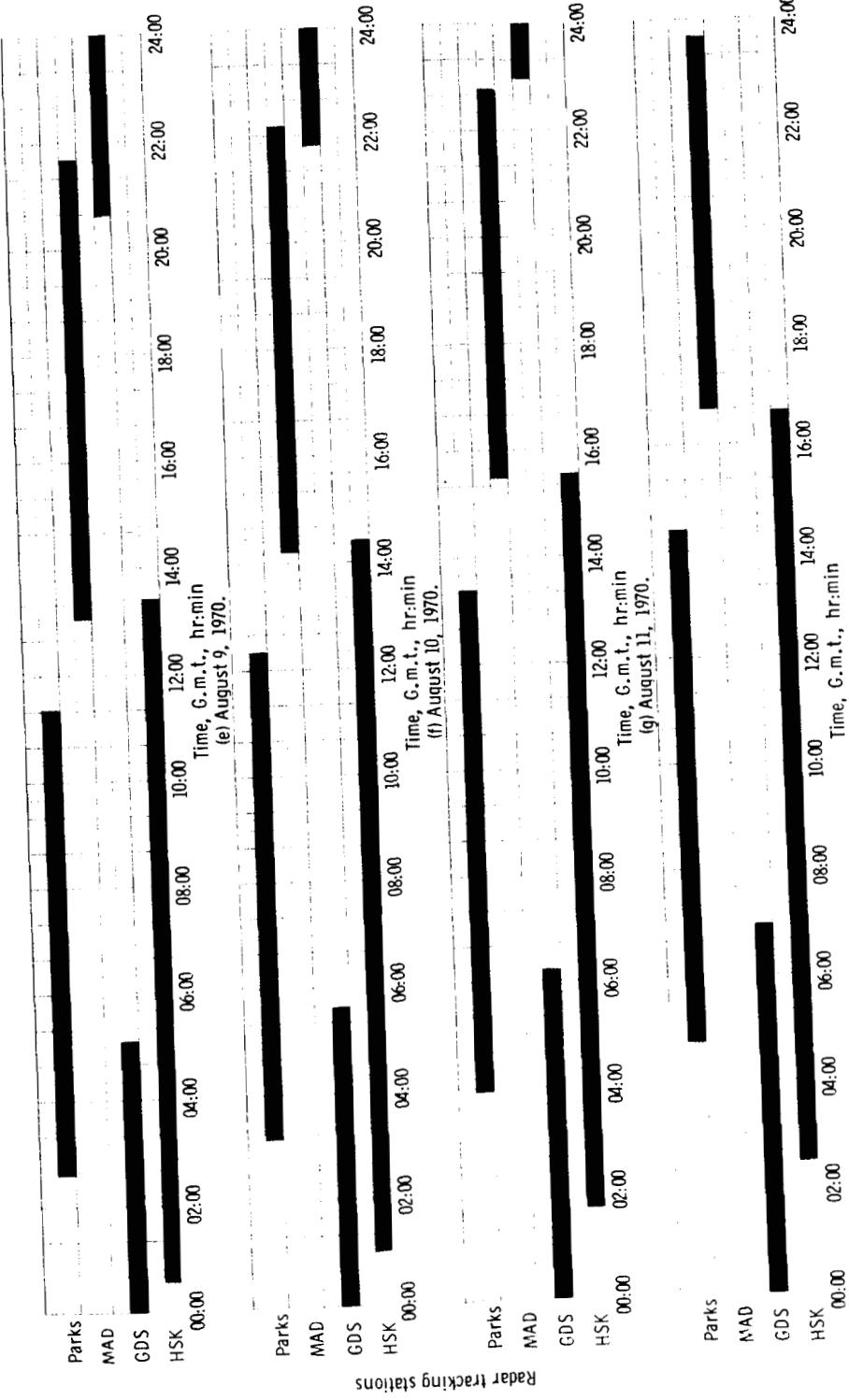


Figure 8. - Continued.

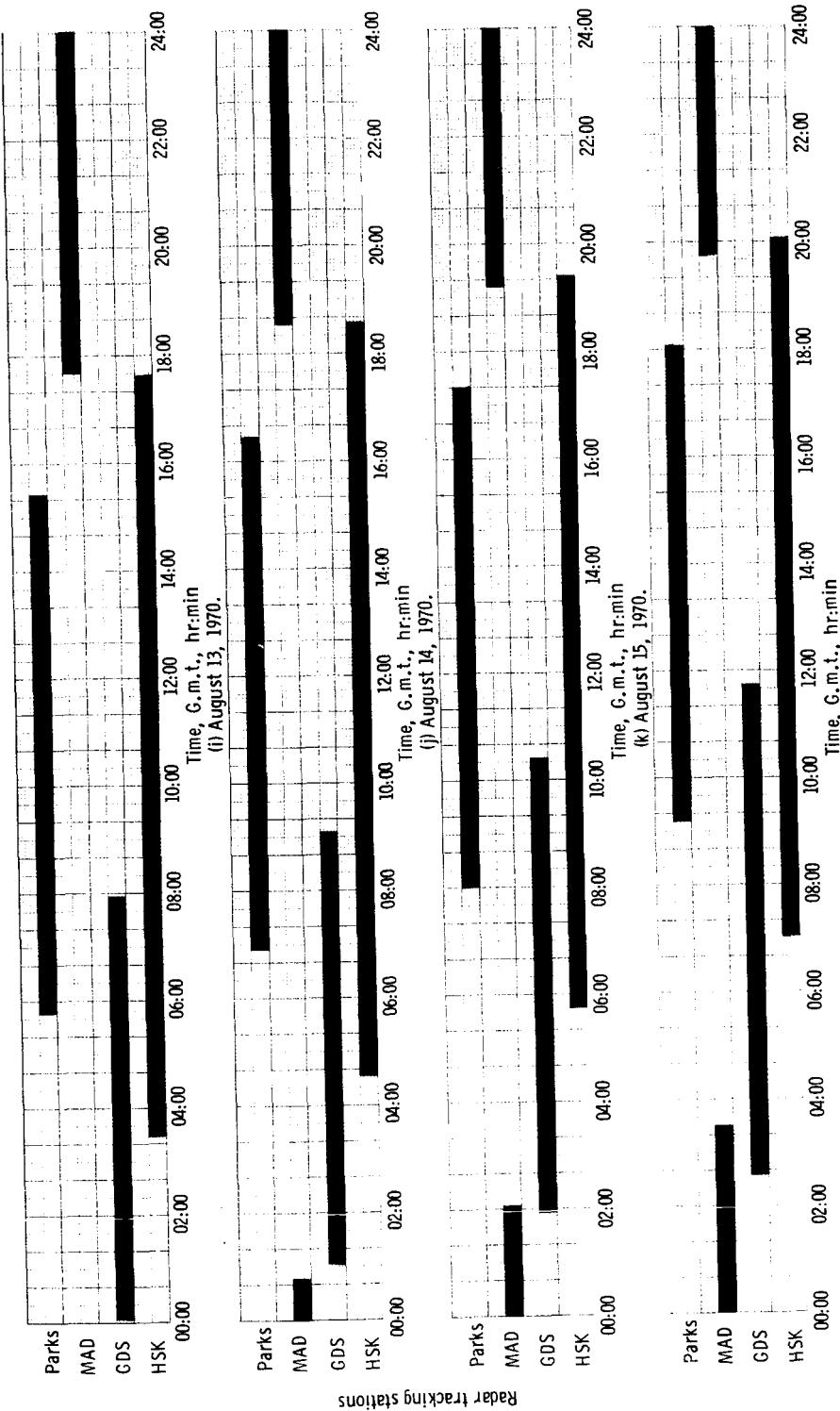


Figure 8. - Continued.

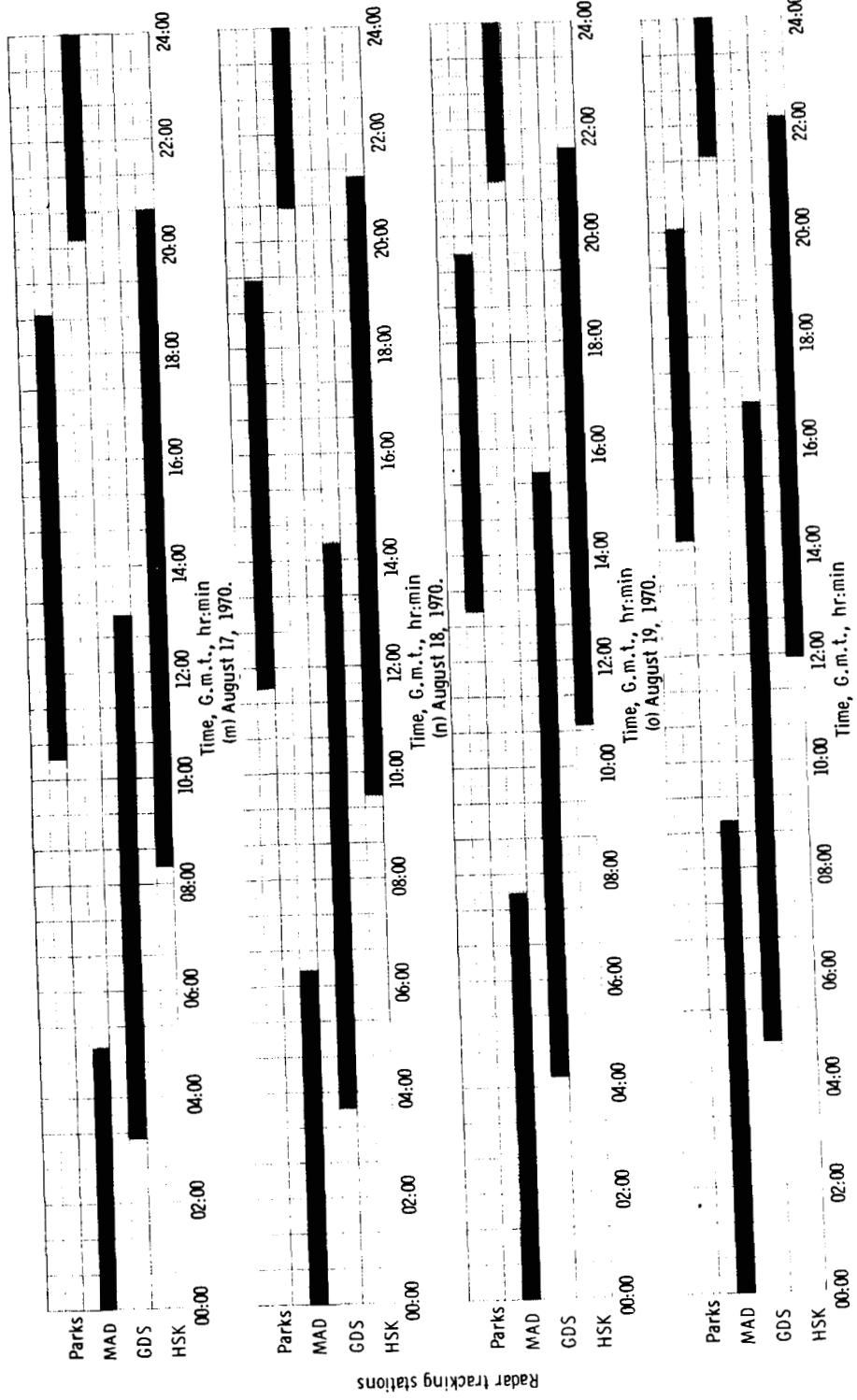


Figure 8. - Concluded.

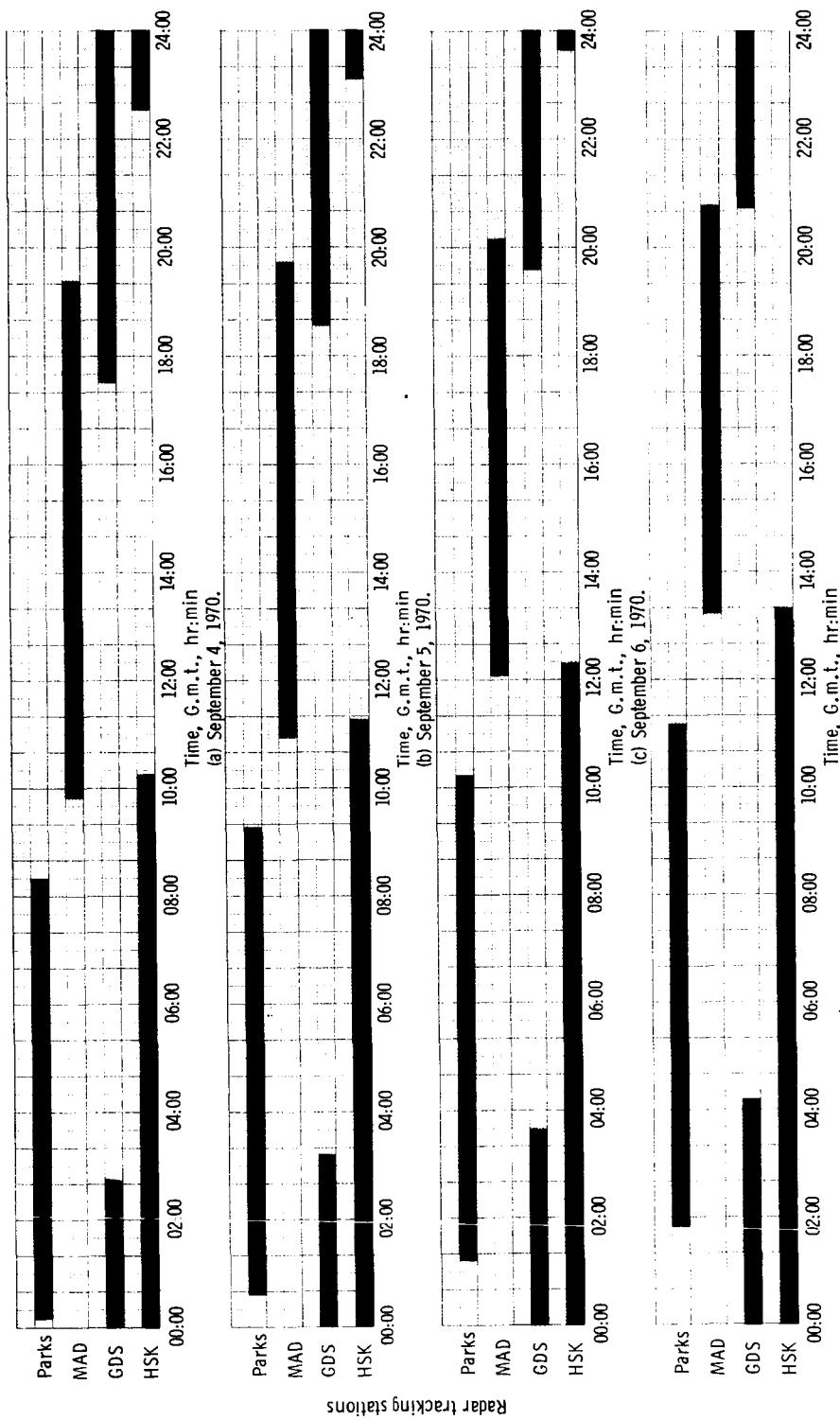


Figure 9. - Lunar tracking coverage for Apollo launch days in September.

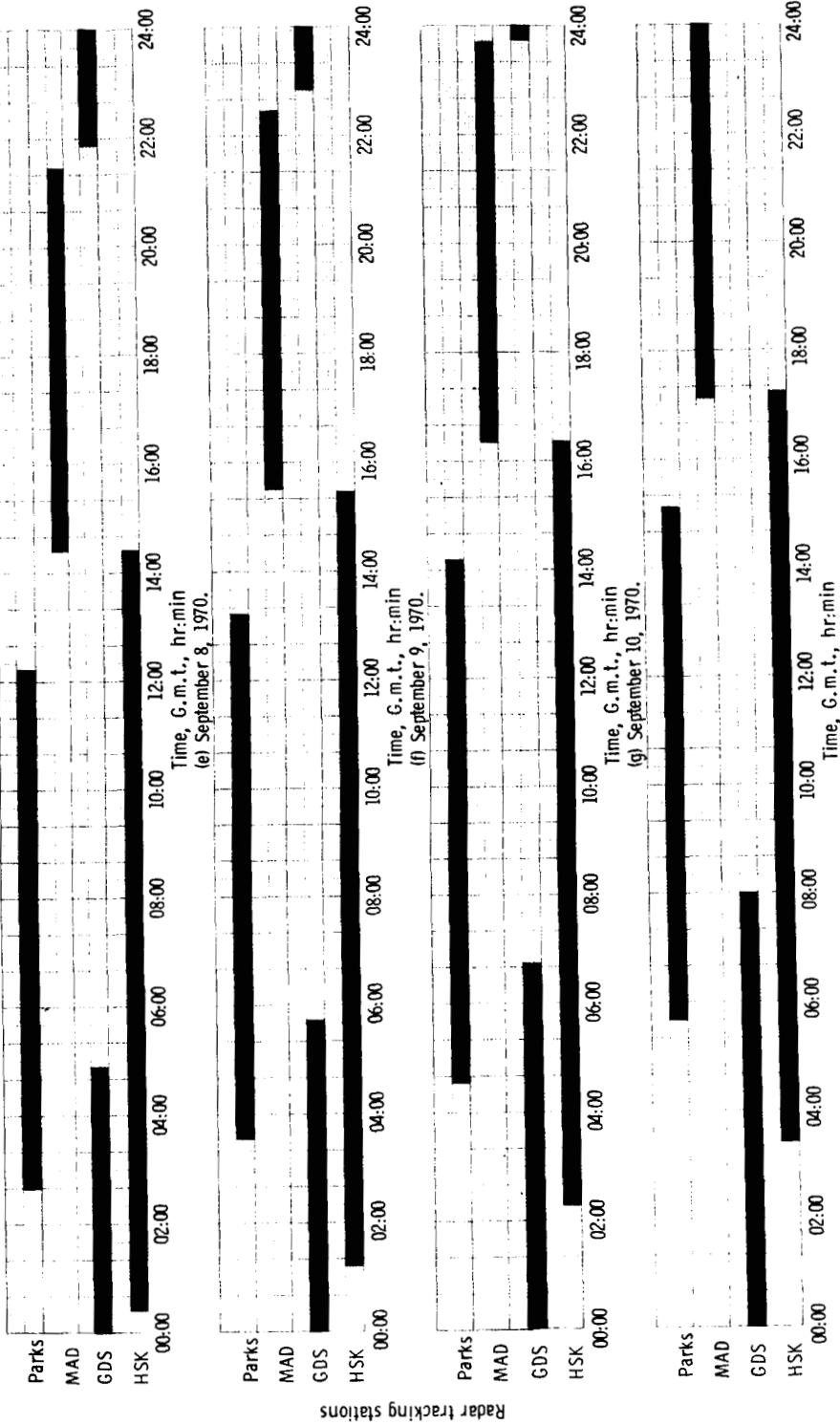
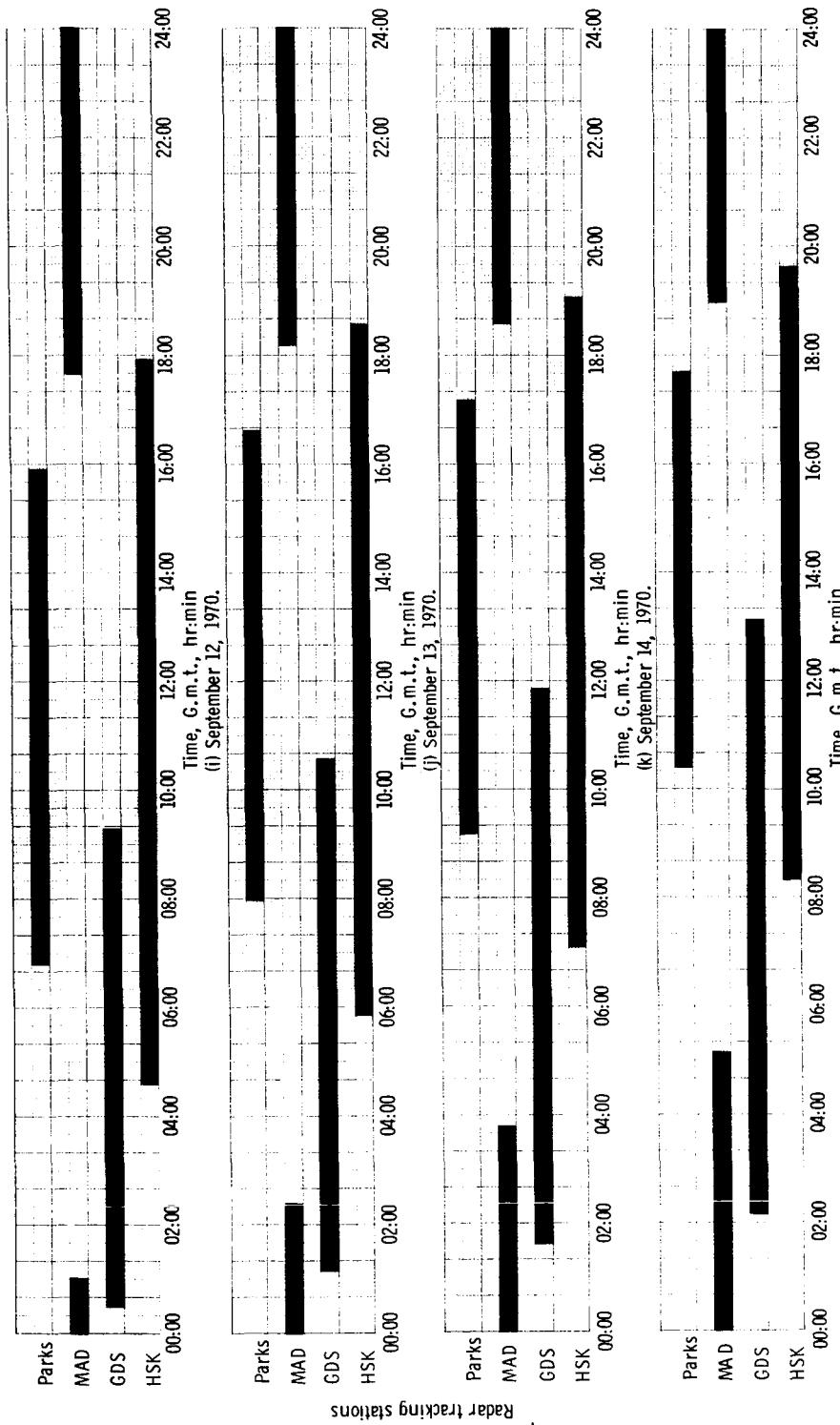


Figure 9.- Continued.



(i) September 12, 1970.  
Figure 9 - Continued.

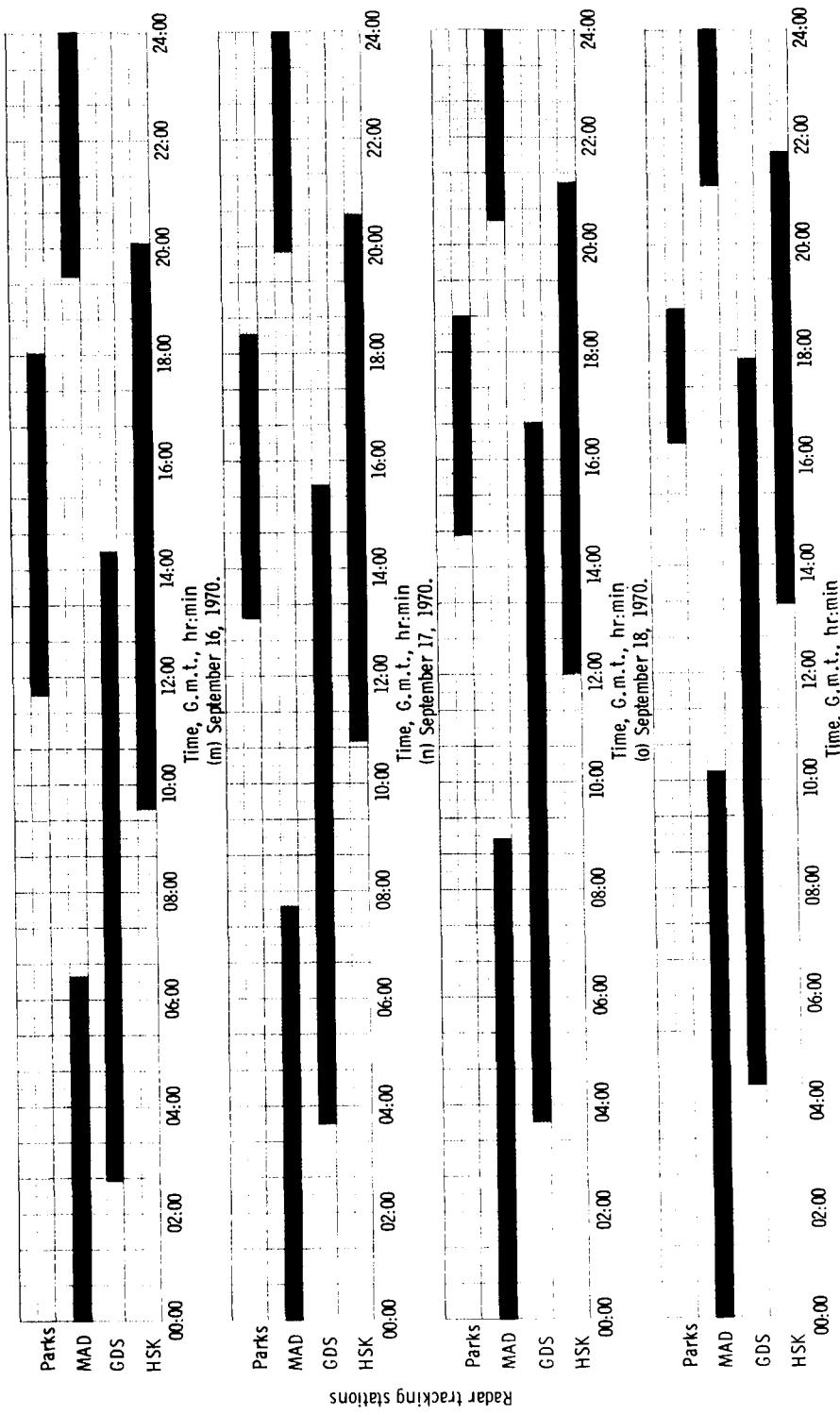


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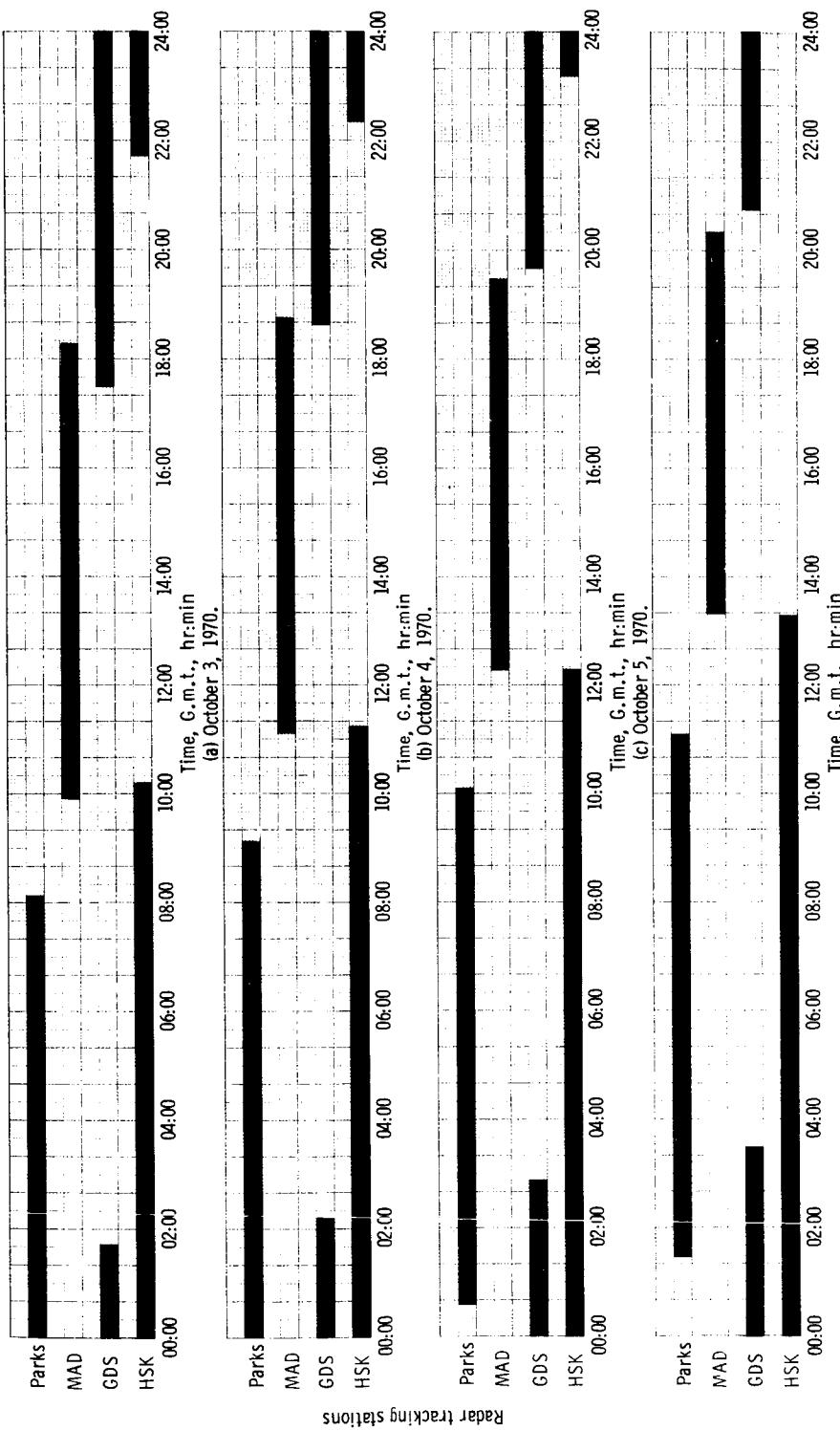
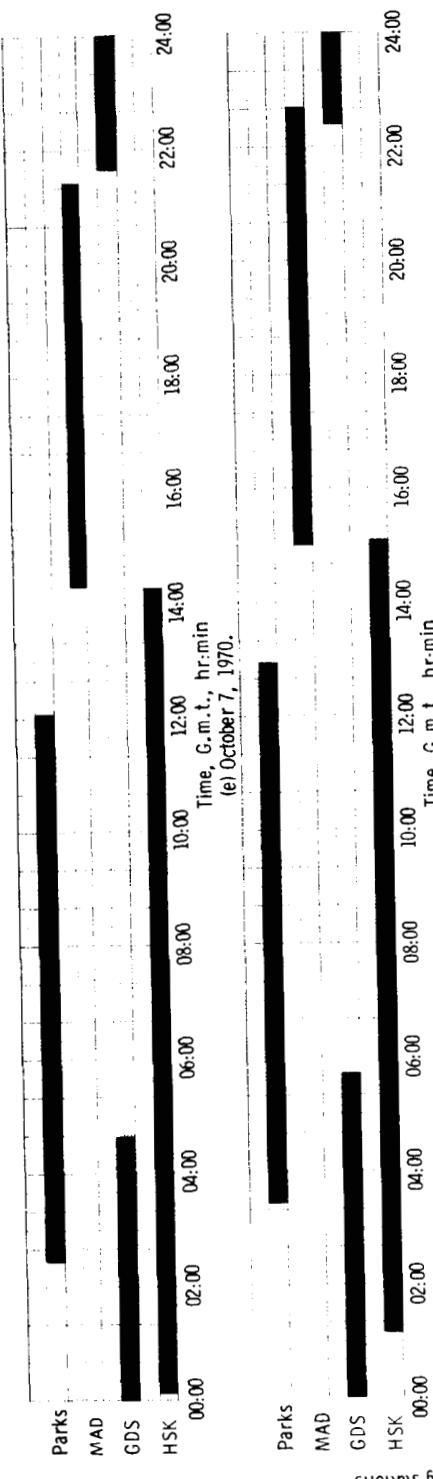
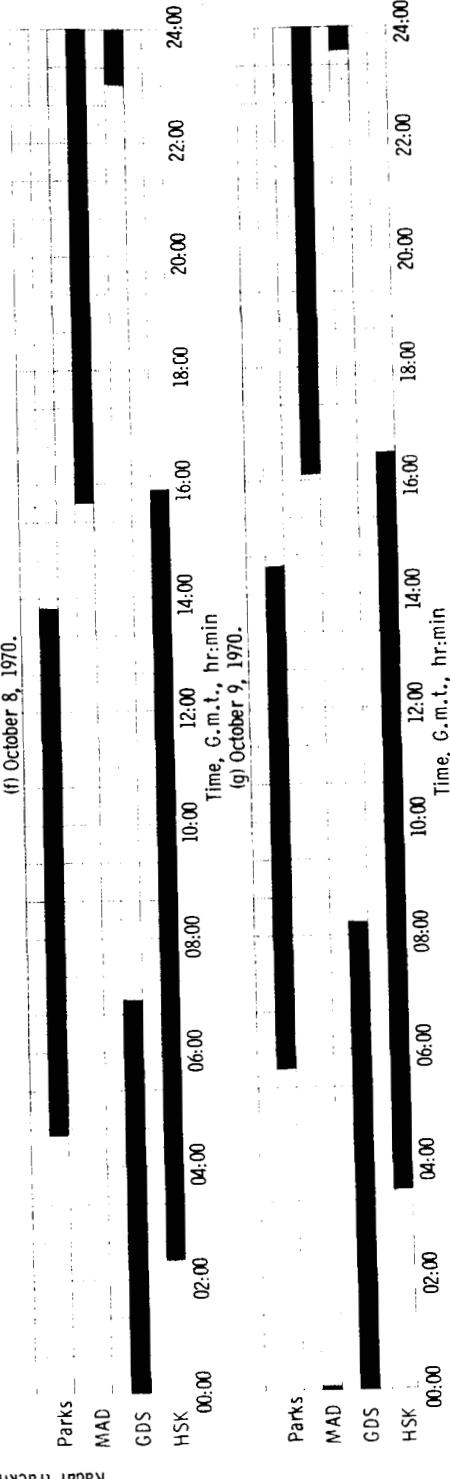


Figure 10. - Lunar tracking coverage for Apollo launch days in October.

(d) October 6, 1970.

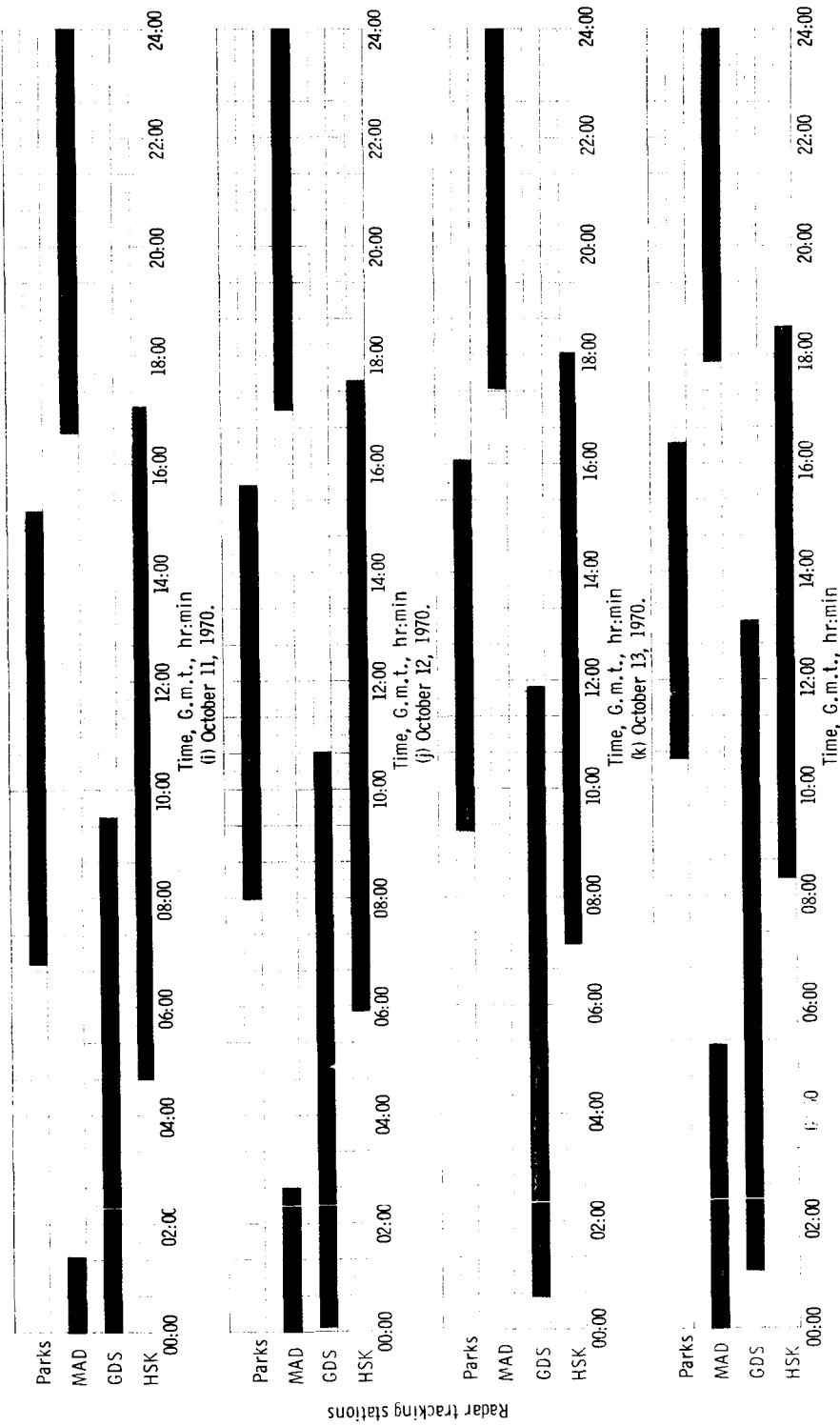


40



(h) October 10, 1970.

Figure 10. - Continued.



(l) October 14, 1970.

Figure 10. - Continued.

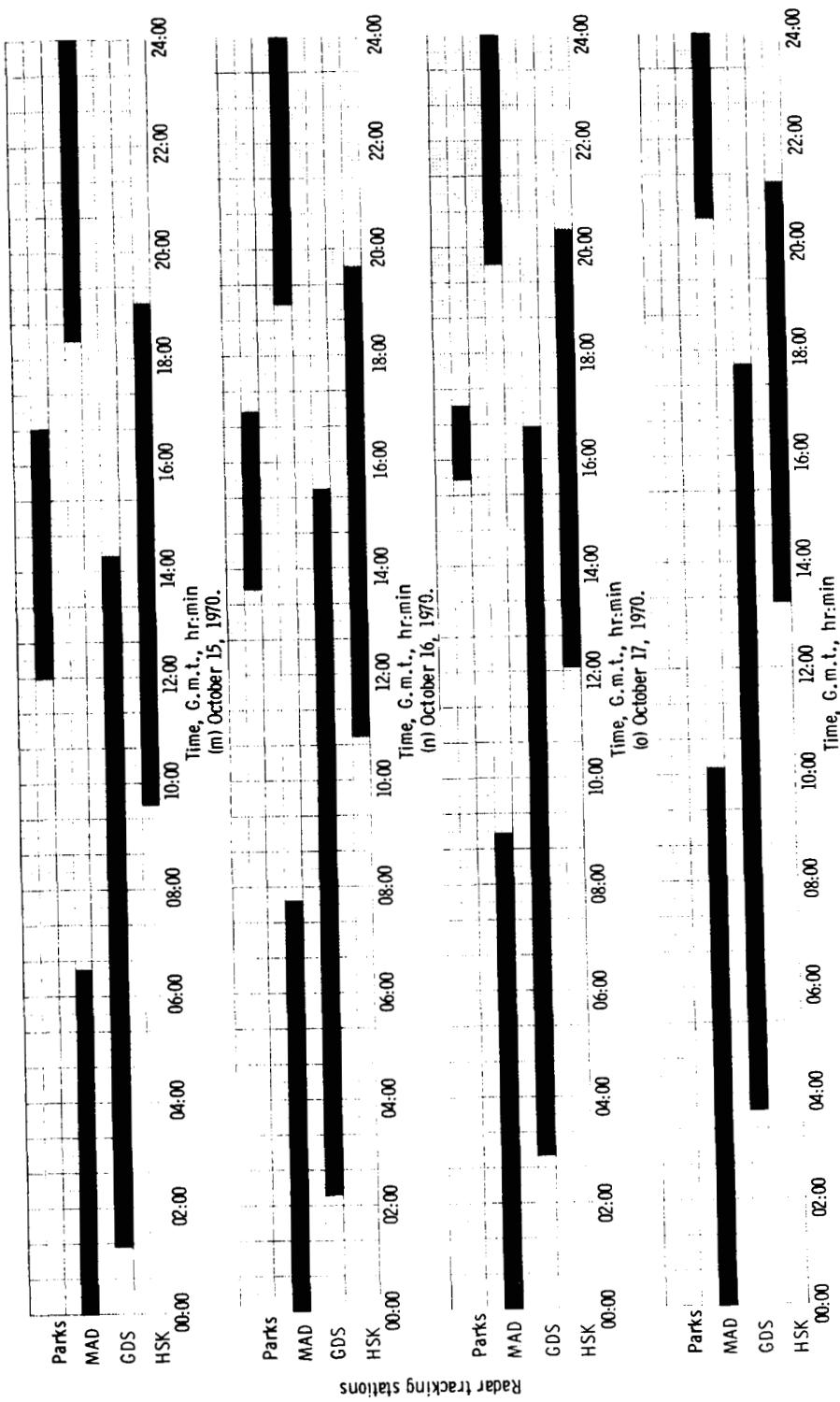


Figure 10. - Concluded.

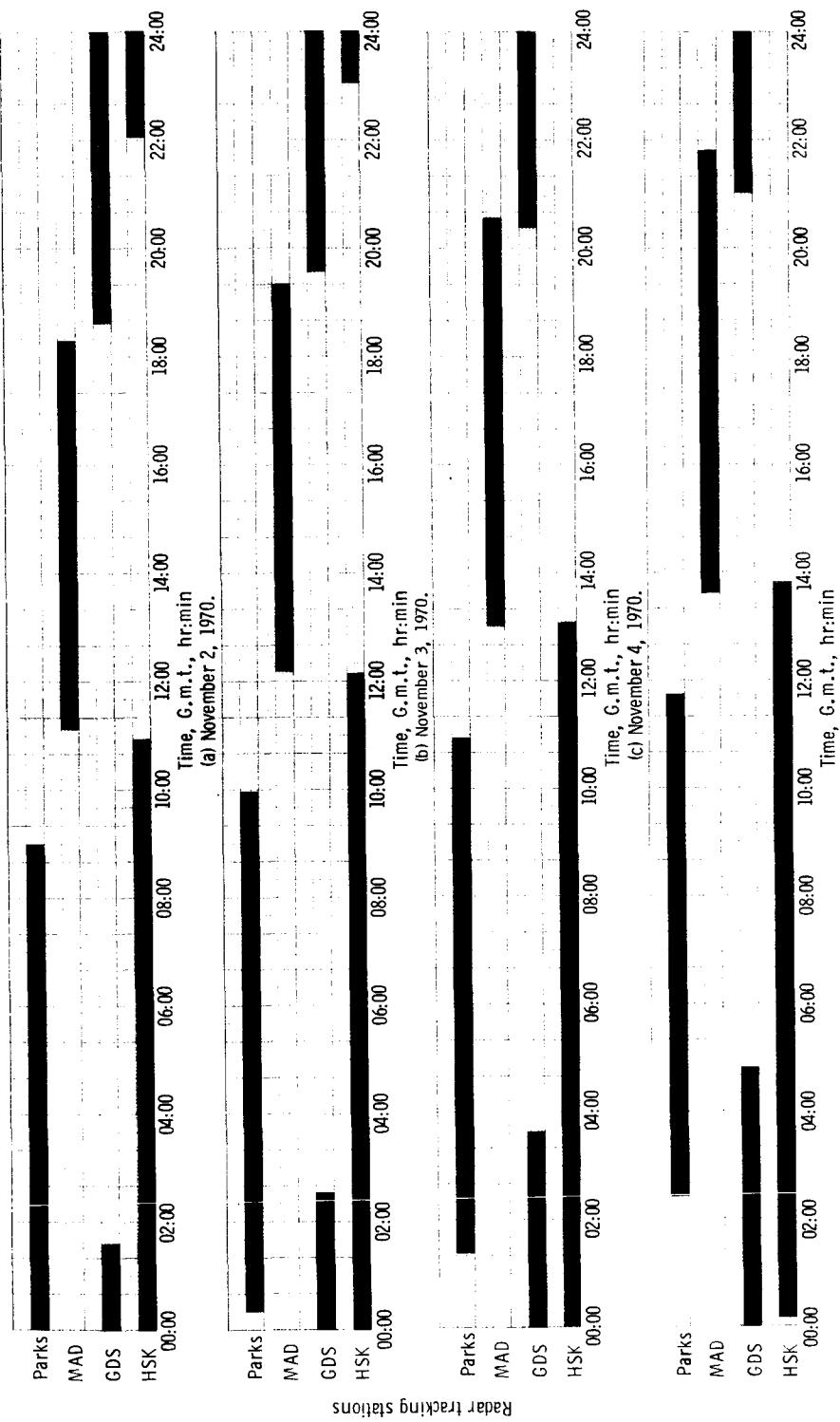


Figure 11. - Lunar tracking coverage for Apollo launch days in November.

(d) November 5, 1970.

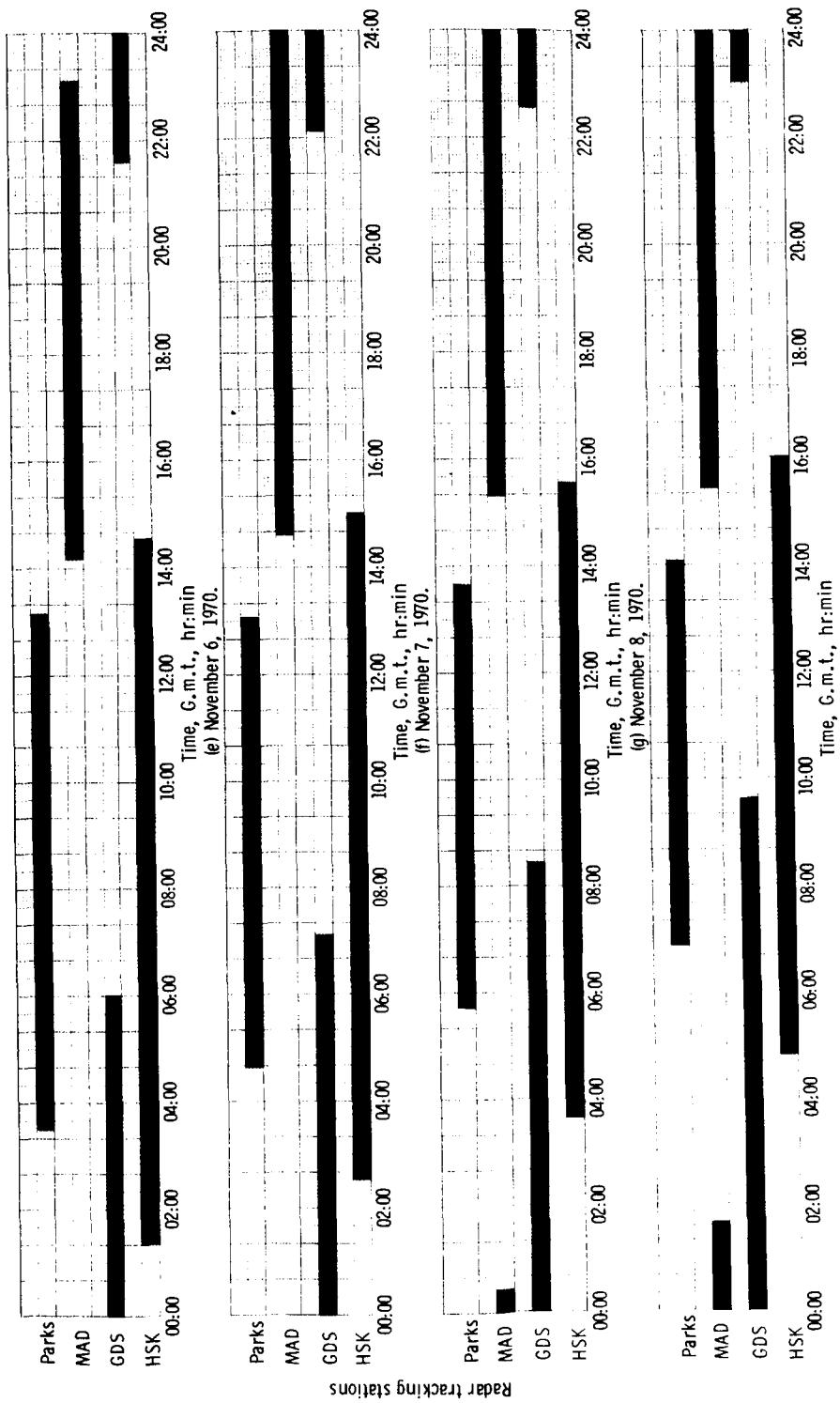
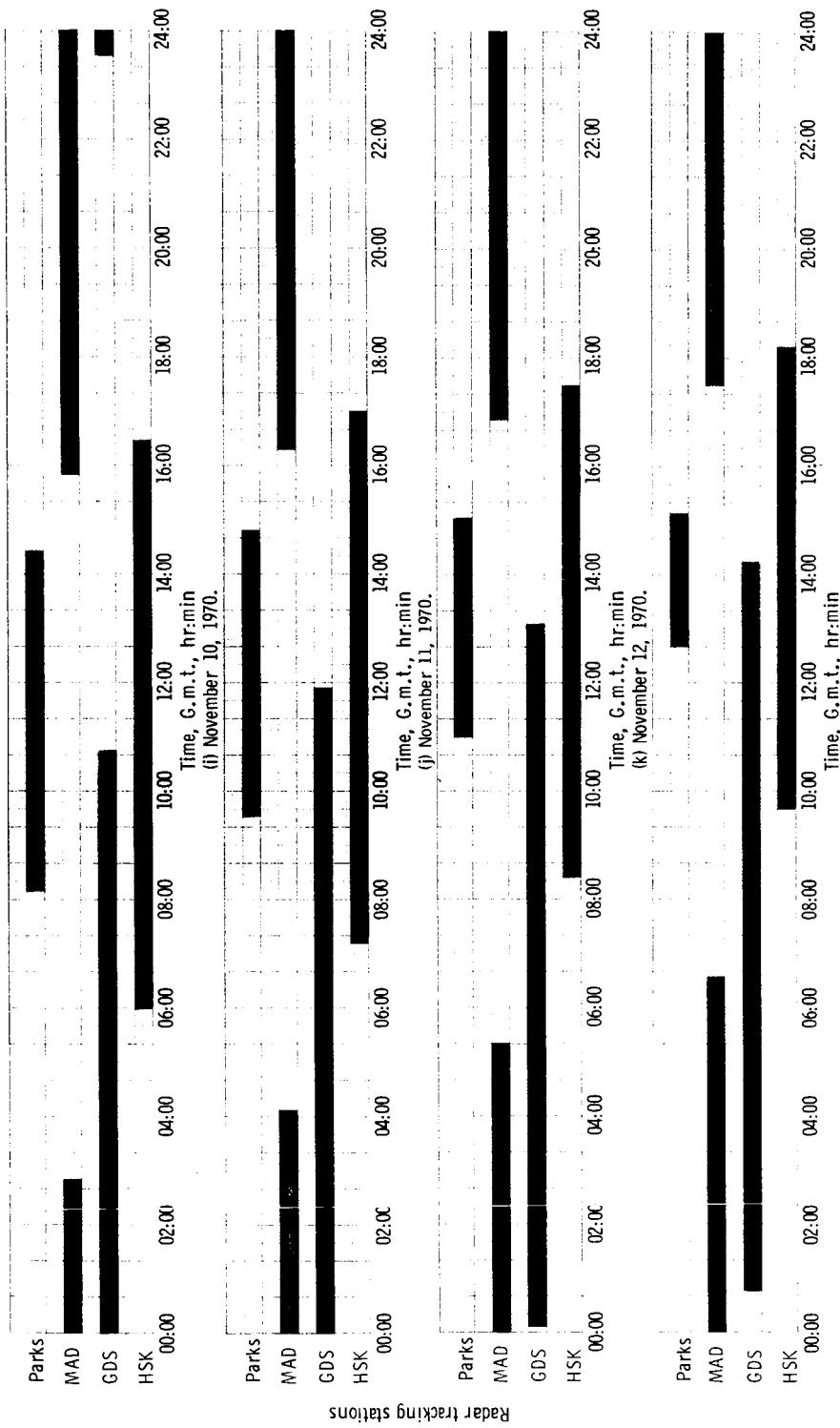
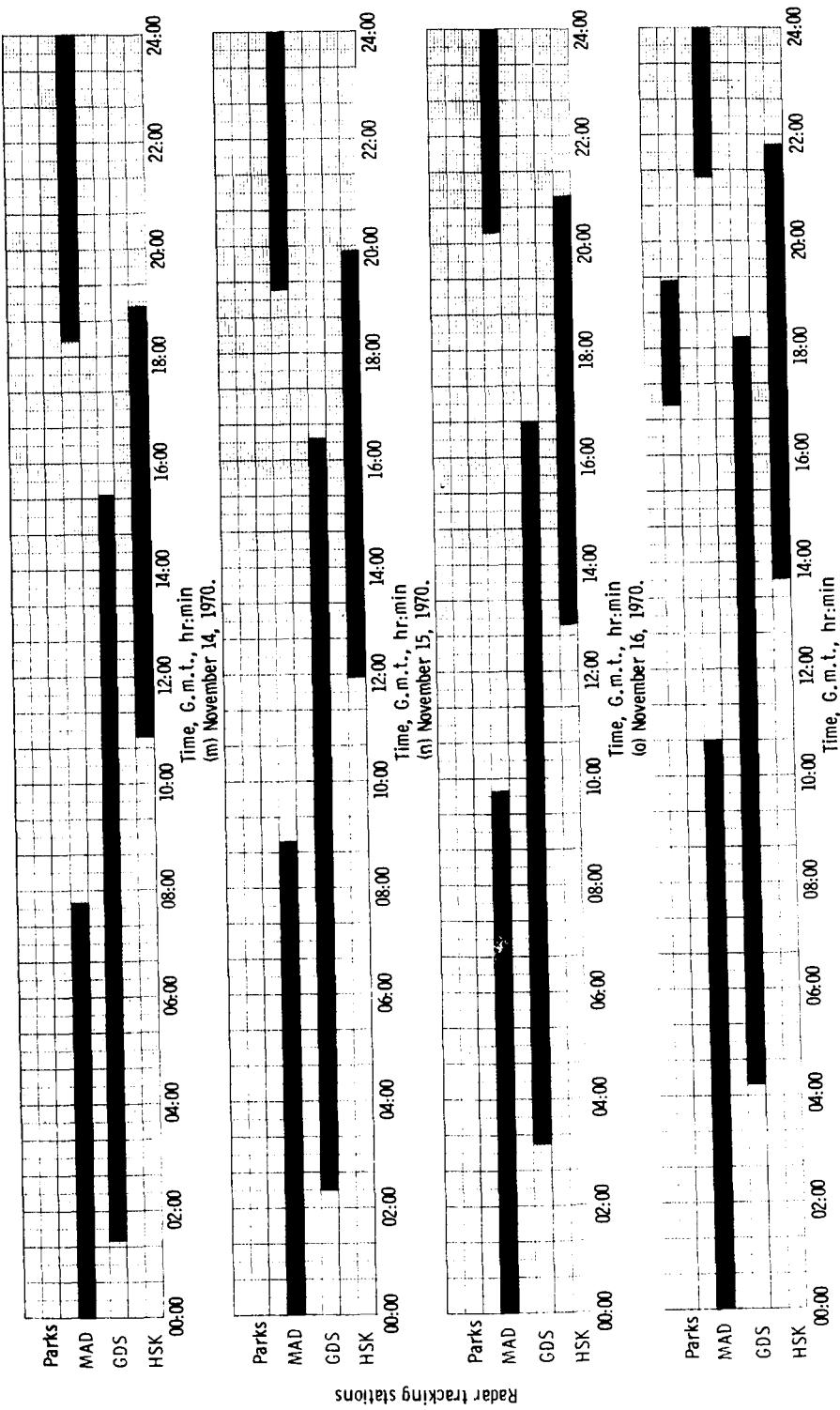


Figure 11. - Continued.



(l) November 13, 1970.

Figure 11. - Continued.



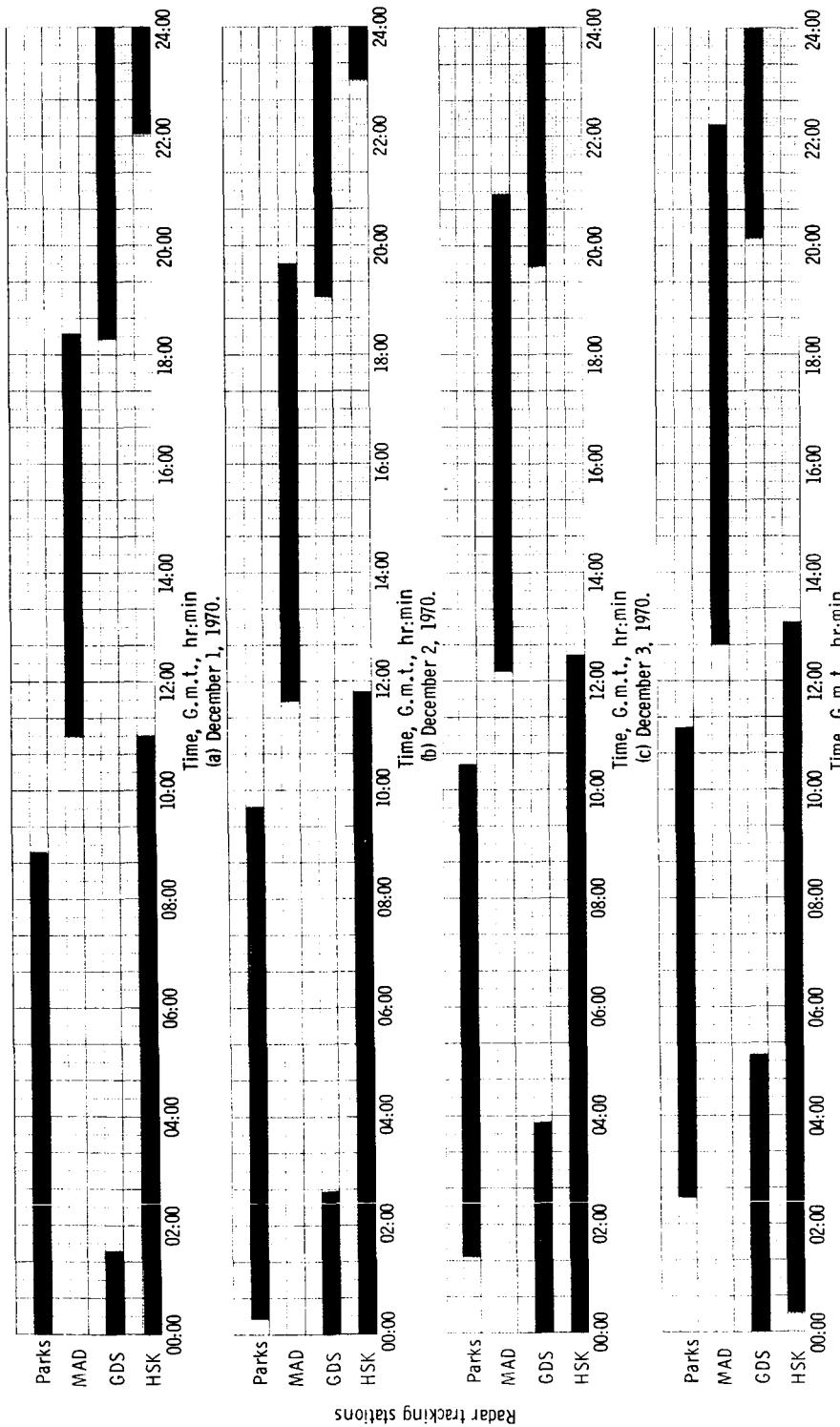


Figure 12. - Lunar tracking coverage for Apollo launch days in December.

(d) December 4, 1970.

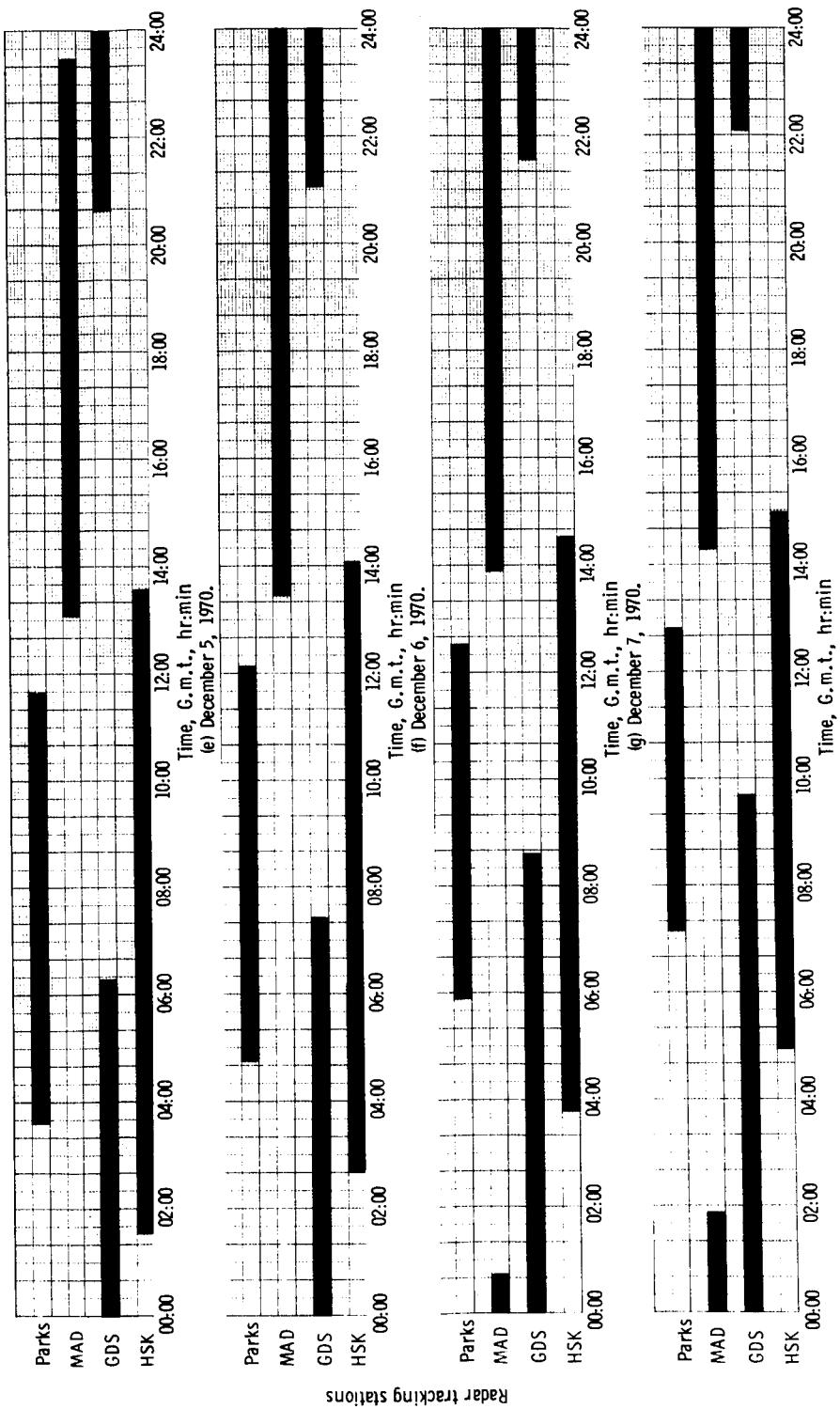
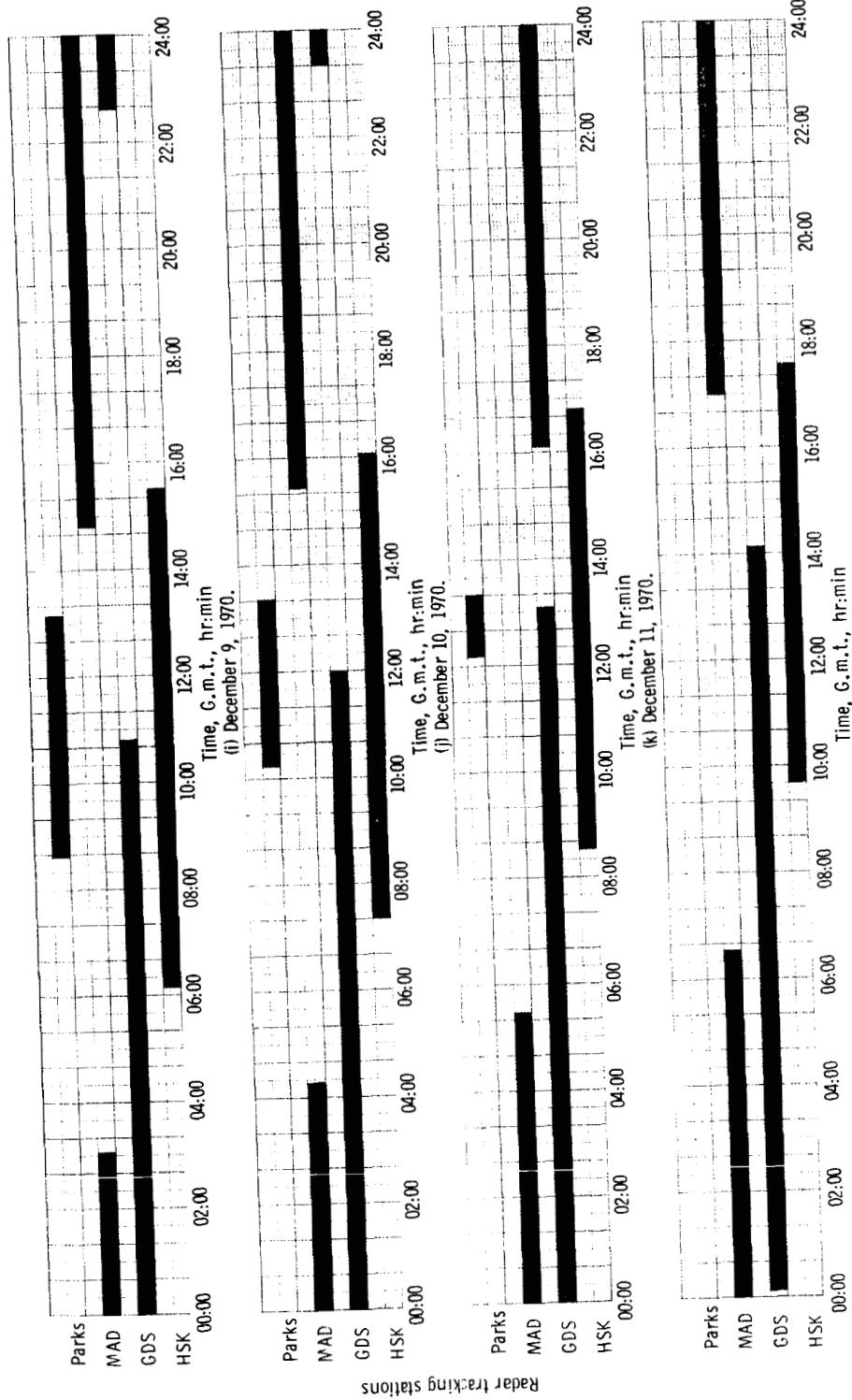
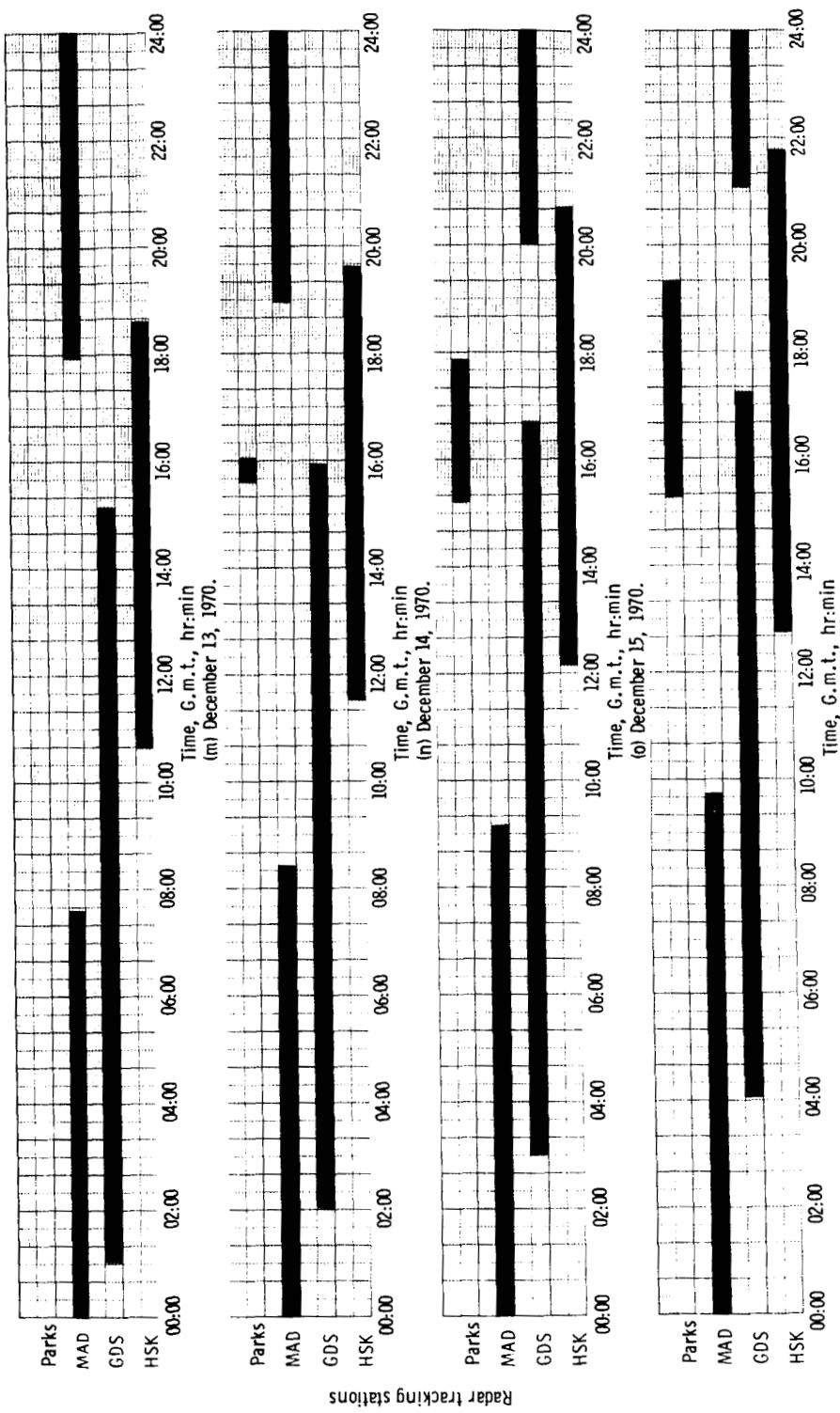


Figure 12 - Continued.  
(h) December 8, 1970.



(l) December 12, 1970.

Figure 12 - Continued.



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(p) December 16, 1970.

Figure 12. - Concluded.